ARS 33-129
October 1968

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service

AZIRIDINYL CHEMOSTERILANTS FOR HOUSE FLIES

By A. B. Bořkovec, R. L. Fye, and G. C. LaBrecque
Entomology Research Division

Alkylating agents derived from ethylenimine (aziridine) were among the first insect chemosterilants found to affect the reproductive capacity of male house flies (*Musca domestica* L.). The historical development of the search for effective chemosterilants was reviewed by Lindquist (8),[1] Bořkovec (1-3), and Smith et al. (10). Since 1960, chemists and entomologists of the Entomology Research Division have cooperated in an extensive program of synthesis, procurement, and testing of over 300 aziridinyl compounds. Bořkovec (3) reviewed some of the results of testing and the results of the dose-response relationship and structure-activity correlation studies. In this publication we present the complete list of and summarize the screening data for all aziridinyl compounds tested on adult house flies in our laboratories.[2]

R_1 to R_5 can be substituted for the five hydrogen atoms in aziridine (ethylenimine), as shown in figure 1.

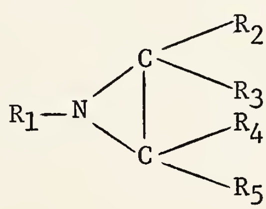


Figure 1.--Substitution of R_1 to R_5 for five hydrogen atoms in aziridine.

---

[1] Numbers in parentheses after the authors' names refer to Literature Cited at the end of this report.

[2] Mention of chemical compounds in this report is not a recommendation. No product should be used in insect control unless it is registered for the specific use intended, as clearly shown on the product label.

The nature of the substituents and the degree of substitution on the ring affect the chemical, physical, and biological properties of the parent compound. Aziridine is a volatile (b.p. 57° C.) and a highly reactive liquid. It can be converted by appropriate substitution to almost inert solid materials, which melt at temperatures above 200° and are insoluble in all common solvents (e.g., table 2, compound 35). Between these two extremes is a great variety of aziridinyl compounds, some of which are highly effective chemosterilants for many species of insects.

Although all chemosterilants are to some extent species specific, the aziridinyl compounds have the broadest spectrum of activity, and all species of insects tested thus far have been at least slightly susceptible to their sterilizing effects. Thus the house fly, which has a relatively short life cycle, is easily reared, and is readily treated with the test compounds, is an almost ideal subject for screening purposes. However, neither the qualitative nor the quantitative structure-activity correlations derived from tests of house flies can be related to other species of insects without exceptions. Only the broadest generalizations concerning the structural requirements of effective sterilants can be applied to the selection of candidate compounds for an untested species.

Of the 301 aziridines listed in tables 1-4, 102 were synthesized in our laboratories. Many of the others were originally synthesized as potential antitumor agents, and samples were made available to us through the Cancer Chemotherapy National Service Center, National Institutes of Health, Public Health Service. The remaining compounds were donated by industrial, academic, and other laboratories here and abroad.

Since most aziridinyl compounds are sensitive to acids, bases, and heat, generally all compounds used in our tests were stored in a refrigerator, and any prolonged contact with water, acids, bases, or other reactive materials was avoided. However, in spite of these precautions, some more sensitive aziridines may have been partially decomposed by the time the screening was completed. Neither the sugar nor the regular fly food diet, in which the candidate compounds were administered to flies, is sufficiently acidic or basic to cause serious difficulty, but the exposure of the formulated chemosterilants to warm moist air and to fly excreta in the test cages undoubtedly caused some degradation of sensitive compounds. Therefore, it was not safe to base conclusions about structure-activity or other relationships on isolated tests, particularly if such tests happened to be negative. However, the series of tests made at various concentrations or in various media did give a rather reliable picture of activity, and all our generalizations concerning qualitative and quantitative effects of aziridines are based on such series.

Highly unstable aziridinyl compounds that were expected to decompose or to disappear within a short time after formulation were excluded from the study. However, we did test a group of volatile monoaziridines (table 1, compounds 1, 3, 4, 71) in an aqueous medium. the results of these tests are not strictly comparable with the results obtained with solid formulations, but they provide a good indication of the activity of volatile compounds administered orally.

SCREENING

In 1961, a standardized technique for testing insect chemosterilants on adult house flies was developed in our laboratory at Orlando, Fla., (which was later moved to Gainesville, Fla.). Compared with previous methods (6, 7), this technique included two new features--the determination of percentages of pupation and the administration of the sterilant in two media. Insects treated with chemosterilants lay only a few or no eggs or the eggs fail to hatch; however, some chemosterilants have delayed effects, that is, the eggs of treated insects hatch, but the larvae die before reaching the pupal stage. Thus the determination of percent pupation is necessary in evaluating the delayed effects. Also, chemosterilants frequently have different quantitative effects when administered in different media. The reasons are not fully understood, and the effects of media on activity usually cannot be predicted.

We administered candidate compounds in two diet media--granulated sugar or regular fly food, which is a mixture of six parts sugar, six parts powdered nonfat dry milk, and one part powdered egg yolk. A measured quantity of the candidate compound was dissolved or dispersed in a suitable volatile organic solvent (e.g., acetone). Then the solution was mixed with the media, the solvent was evaporated, the residue was repulverized, and the treated diet was placed in a cage containing 100 newly emerged flies of both sexes. Similar cages of 100 flies were provided with untreated diet and were used as checks. After 3 days the treated flies were examined for mortality caused by the sterilant, and then untreated regular fly food, which provided the protein for egg development, was offered to those flies that had been fed the treated sugar diet.

When the flies were 6 to 7 days old, a sample cup containing 1.2 cm of moist CSMA (Chemical Specialties Manufacturers Association)[3] medium was put in each cage to provide a convenient site for oviposition. After 4 to 6 hours the cup was removed and filled with water, and the medium was stirred to break up the egg masses. If no eggs were laid, the oviposition medium was offered again at intervals of 1 to 2 days until it had been offered five times or until the flies oviposited.

---

[3] Mention of proprietary products and commercial organizations in this report is solely to provide specific information. It does not constitute endorsement by the U. S. Department of Agriculture over other products and organizations not mentioned.

A random sample of 100 eggs was collected from each cup and placed on a small piece of wet black cloth, which was laid on top of moist larval medium in a rearing container. After the eggs had been exposed on the larval medium for 2 to 3 days, the percent hatch was determined. Since larvae that hatched crawled from the cloth into the rearing medium, the pupae there were counted about a week after oviposition to determine the number of larvae that had developed into pupae.

In tests for male sterility, only male flies were offered the treated diet. Insemination of females was insured by confining these treated males to cages with one-half their number of virgin females. Then ovipositing females were egged two or three times, and the percent hatch and pupation were determined in the usual way. The results of the second and third eggings indicated the permanence of the effects of the male chemosterilant. High percent sterility in the first batch of eggs and low or no sterility in the second and third batch indicated temporary sterilization.

Most compounds were first tested at a concentration of 1 percent. Those causing sterility or mortality were tested at lower concentrations. Those producing only partial sterility at 1 percent were tested at 2.5 and 5.0 percent. Some compounds available only in small quantities were not tested in both media or at all concentrations.

DISCUSSION OF RESULTS

The screening results are summarized in tables 1-4. The compounds are divided into four categories according to the number of aziridinyl groups they contain. In table 1 are listed the monoaziridines tested, in table 2 the diaziridines, in table 3 the triaziridines, and in table 4 the polyaziridines with four to eight aziridinyl rings per molecule. The first three categories of aziridines are also subdivided according to the mode of substitution on the aziridinyl ring. As indicated in figure 1, the substituents R_2 to R_5 can be hydrogen or some other monovalent group. Thus tables 1-3 contain only those aziridines in which at least one of the substituents R_2 to R_5 is not hydrogen. The last group of aziridines (table 4) is rather small, and further subdivision appeared unnecessary.

The unsubstituted aziridine--ethylenimine (table 1, compound 1)--is a volatile liquid soluble in all common solvents. This compound is a basic building stone of all aziridines, and numerous experiments were made to determine its effects on the reproduction of house flies. Since the lack of activity it showed when fed in the dry sugar diet could have been caused by its rapid volatilization, the compound was next given in an aqueous sugar solution. However, the results were only moderate, even though house flies can consume a considerably larger amount of a test compound in sugar water than in solid food.

Bořkovec et al. (4), therefore, tried to avoid decomposition of the highly reactive ethylenimine in the flies' digestive system and to insure its entry into the hemolymph by injecting male house flies with 0.2 to 5.0 µg. of ethylenimine per fly. Again this treatment did not produce any appreciable sterility in the insects. Also, a solid complex of ethylenimine with picric acid (table 1, compound 2) had no effect on the fertility of treated flies. Ethylenimine apparently is only a weak house fly chemosterilant, and the high activity of the many effective aziridinyl compounds is not the result of their degradation to free ethylenimine in the organism.

The data in tables 1-4 show that although the sterilizing activity of an unsubstituted or C-substituted aziridine can be increased by appropriate N-substitution (fig. 1, R_1), all attempts to increase the activity of an unsubstituted or N-substituted aziridine by any C-substitution (fig. 1, R_2 to R_5) were unsuccessful. Thus we can generalize that varying the substitution on the aziridinyl nitrogen is the only way to improve the sterilizing activity of any given aziridine, and the types of substituents that produce effective sterilants are limited to groups containing polar, high electron-density systems. The most common of the groups are shown in figure 2.

$$\overset{+\delta}{C} = \overset{-\delta}{O} \qquad \overset{+\delta}{P} = \overset{-\delta}{O} \qquad \overset{+\delta}{S} = \overset{-\delta}{O}$$

$$\overset{+\delta}{C} = \overset{-\delta}{N} \qquad \overset{+\delta}{P} = \overset{-\delta}{N} \qquad \overset{+\delta}{S}\begin{smallmatrix} \diagup\!\!\diagup \overset{-\delta}{O} \\ \diagdown\!\!\diagdown O \end{smallmatrix}$$

$$\overset{+\delta}{C} = \overset{-\delta}{S} \qquad \overset{+\delta}{P} = \overset{-\delta}{S}$$

Figure 2.--Substituents on aziridinyl nitrogen occurring in active chemosterilants

Though the positive end of the polar group of most effective compounds is attached directly to the aziridinyl nitrogen, the group can exert some effect even through one methylene group. For example, compare compound 24 with 5 and 28 with 7 (table 2). This broad generalization concerning the effects of substitution on aziridinyl nitrogen is valid without regard to the type or number of substituents on the aziridinyl carbons or to the number of aziridinyl rings present in the molecule. The number of functional alkylating groups required for sterilizing activity was discussed in detail by Bořkovec (3). The present experimental results confirm that conclusion that active chemosterilants can be found among both monofunctional (table 1) and polyfunctional (tables 2 and 4) aziridinyl compounds but that the polyfunctional compounds are generally more active than their monofunctional analogs.

A second generalization becomes apparent when the activity of compounds shown in tables 1-3 is compared with the activity of analogous C-substituted compounds shown in these tables. It concerns the effects of substitution on the aziridinyl carbon atoms. If two analogous compounds, one without C-substituents and the other with C-substituents, are compared, the unsubstituted compound invariably shows higher sterilizing activity than the substituted compound. C-methyl substitution appears the least injurious to the activity of the parent compound, and the differences between the effects of such pairs of compounds are sometimes too small to be detected by the feeding method. See, for example, table 2, compounds 30 and 99, 22 and 98, and 35 and 102.

Detailed quantitative studies in which the dose administered to each individual insect is precisely known are laborious, and they have been conducted with only a few compounds. Nevertheless, the results of quantitative experiments performed with tepa (table 3, compound 8) and metepa (table 3, compound 14) by Chang and Bořkovec (5) on male house flies and by Murvosh et al. (9) on flies of both sexes confirm the conclusion that C-methylation substantially reduces the activity of the parent compound.

Substitution with electron-withdrawing substituents on the aziridinyl carbon is difficult because synthesis is a problem, and only a limited number of such derivatives is known. However, the lack of activity of an ethoxycarbonyl-substituted compound (table 3, compound 25) derived from an active unsubstituted compound (table 3, compound 8) indicates that whatever the electronic characteristics of the substituents, the major activity-reducing factor, that is, substitution on the aziridinyl carbon, cannot be overcome.

The physical properties of aziridinyl compounds are probably as important in determining their sterilizing activity as their chemical structures. However, all attempts to correlate solubility, molecular shape, size, or other physical properties with the sterilizing activity of aziridinyl compounds have been unsuccessful. Many highly active aziridines are soluble in both polar and nonpolar solvents, but notable exceptions are known (table 2, compounds 24, 26, 35). Stereoisomers of some aziridinyl compounds were available for testing (table 3, compounds 15, 17, 18), but the differences in their effectiveness did not appear to be significant, and the results of a single test with compound 18 in table 3 are dubious. (The compound was available only in milligram quantities, and its purity appeared to be low.) Although there may be an upper limit to the molecular size of chemosterilants, the other physical properties of large molecules, particularly solubility and transport characteristics, may interfere with any determination about which factor was responsible for the change in biological activity.

We have already stressed that the chemosterilizing effects of a compound on house flies do not necessarily indicate the scope or activity of that compound on other species of insects. Only the Mexican fruit fly (*Anastrepha ludens* (Loew)) and the screw-worm (*Cochliomyia hominivorax* (Coquerel)) have been used in extensive screening of chemosterilants, and only a few aziridines have been tested on other insect species. Nevertheless, the two broad generalizations about the structure-activity relationship appear to be valid for all species of insects. Also, species specificity, which is particularly pronounced in the nonalkylating chemosterilants (3), though still evident in the aziridinyl compounds, is much less pronounced than in any other group of chemosterilants.

EXPLANATION OF TABLES

In the tables, the entomology number (ENT-) refers to code numbers assigned to compounds tested in the Entomology Research Division. All compounds are named according to the index system used by "Chemical Abstracts." Only compounds of known structure are included. In a few instances the positions of substituents on the aromatic rings are unknown, and this has been indicated in the structural formula by a long line reaching the center of the aromatic system. Under the heading Source, the following abbreviations are used: PCRB (Pesticide Chemicals Research Branch, Entomology Research Division, Beltsville, Md.), CCNSC (Cancer Chemotherapy National Service Center, National Institutes of Health, Public Health Service, Bethesda, Md.), and USDA (U. S. Department of Agriculture). Under Concentration, the percentages are based on the number of grams of test compound added to 100 grams of dry food.

Under the sterilization columns are shown the effects of the test compound when it was administered to both sexes on percent hatch and percent pupae. Numbers followed by the male sign (♂) refer to effects of the compound administered to males only. Numbers in parentheses are values obtained when the experiments were duplicated, but if the parenthesis is followed by ♂, the numbers indicate the results of second or third eggings of untreated females crossed with treated males. Dashes (-) indicate that the experiment was not performed at the given level in one of the diet media. The notation NO (no oviposition) means that the females laid no eggs, even after repeated egging.

LITERATURE CITED

(1) Bořkovec, A. B.
1962. Sexual sterilization of insects by chemicals. Sci. 137: 1034-1037.

(2) ______________
1964. Insect chemosterilants. Their chemistry and application. Residue Rev. 6: 87-103.

(3) ______________
1966. Insect chemosterilants. Advances in pest control research. V. VII, 143 pp. Interscience Publishers, Inc., New York.

(4) ______________ Chang, S. C., and Limburg, A. M.
1964. Effect of pH on sterilizing activity of tepa and metepa in male house flies. Jour. Econ. Ent. 57: 815-817.

(5) Chang, S. C., and Bořkovec, A. B.
1964. Quantitative effects of tepa, metepa, and apholate on sterilization of male house flies. Jour. Econ. Ent. 57: 488-490.

(6) Gouck, H. K., Crystal, M. M., Bořkovec, A. B., and Meifert, D. W.
1963. A comparison of techniques for screening chemosterilants of house flies and screw-worm flies. Jour. Econ. Ent. 56: 506-509.

(7) LaBrecque, G. C., Adcock, P. H., and Smith, C. N.
1960. Tests with compounds affecting house fly metabolism. Jour. Econ. Ent. 53: 802-805.

(8) Lindquist, A. W.
1961. Chemicals to sterilize insects. Wash. Acad. Sci. Jour. 51: 109-114.

(9) Murvosh, C. M., LaBrecque, G. C., and Smith, C. N.
1964. Effect of three chemosterilants on house fly longevity and sterility. Jour. Econ. Ent. 57: 89-93.

(10) Smith, C. N., LaBrecque, G. C., and Bořkovec, A. B.
1964. Insect chemosterilants. Ann. Rev. Ent. 9: 269-284.

Table 1.--Monoaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies

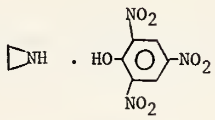
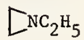
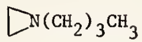
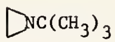
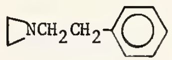
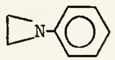
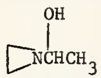
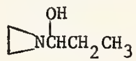
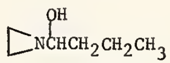
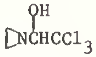
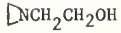
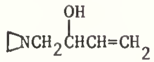
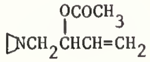
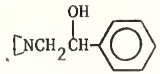
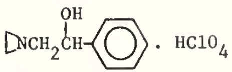
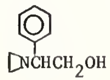
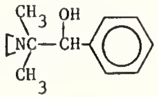
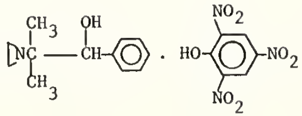
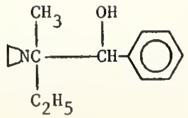
Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
				Without Substituents					
					Percent	Percent	Percent	Percent	Percent
1	50324	Ethylenimine		Commercial	1.0	-	-	100 24 1/	95 14 1/
2	50369	Ethylenimine, picrate		PCRB	1.0	-	-	93	93
3	50409	Aziridine, 1-ethyl-		Interchemical Corp.	1.0	-	-	91 1/	85 1/
4	50668	Aziridine, 1-butyl-		Commercial	1.0	-	-	92 1/	88 1/
5	50488	Aziridine, 1-tert-butyl-		A. T. Bottini, Univ. Calif.	1.0	98	89	98	74
6	50410	Aziridine, 1-phenethyl-		Interchemical Corp.	1.0	-	-	94	80
7	50491	Aziridine, 1-phenyl-		A. T. Bottini Univ. Calif.	1.0	100	90	99	94
8	50554	1-Aziridinemethanol, α-methyl-		Dow Chemical Co.	1.0	100	85	100	79
9	50555	1-Aziridinemethanol, α-ethyl-		do.	1.0	93	50	99	88
10	50553	1-Aziridinemethanol, α-propyl-		do.	1.0	91	90	89	72

Table 1.--Monoaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies--Continued

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
			Without Substituents						
					Percent	Percent	Percent	Percent	Percent
11	50891	1-Aziridinemethanol, α-(trichloromethyl)-		PCRB	1.0	100	60	100	77
12	50768	1-Aziridineethanol		Commercial	1.0	82	76	85	81
13	50587	1-Aziridineethanol, α-vinyl-		CCNSC	1.0	95	90	97	91
14	50700	1-Aziridineethanol, α-vinyl-, acetate		CCNSC	1.0	98	95	80	77
15	50475	1-Aziridineethanol, α-phenyl-		C. L. Stevens Wayne State Univ.	1.0	-	-	92	88
16	50480	1-Aziridineethanol, α-phenyl-, perchlorate		do.	1.0	-	-	100	82
17	50477	1-Aziridineethanol, β-phenyl-		do.	1.0	-	-	97	91
18	50474	1-Aziridineethanol, β,β-dimethyl-α-phenyl-		do.	1.0	-	-	95	85
19	50476	1-Aziridineethanol, β,β-dimethyl-α-phenyl-, picrate		do.	1.0	-	-	98	90
20	50381	1-Aziridineethanol, β-ethyl-β-methyl-α-phenyl-		do.	1.0	-	-	96	93

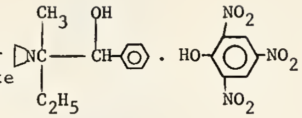
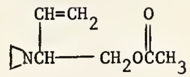
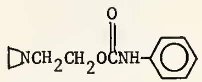
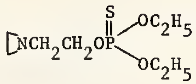
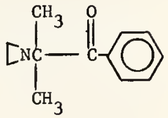
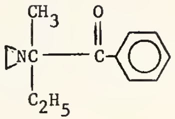
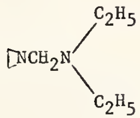
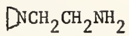
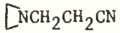
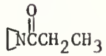
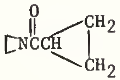
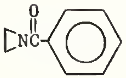
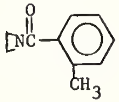
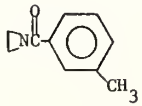
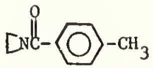
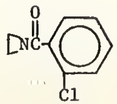
21	50479	1-Aziridineethanol, β-ethyl-β-methyl-α-phenyl-, picrate		C. L. Stevens Wayne State Univ.	1.0	97	75	85	36
22	50863	1-Aziridineethanol, β-vinyl-, acetate		CCNSC	1.0	91	70	97	67
23	33171	1-Aziridineethanol, carbanilate		PCRB	1.0 .5 .25	99 - -	96 - -	NO[2/] 79 75	0 20 51
24	50766	Phosphorothioic acid, _O_-[2-(1-aziridinyl)=ethyl] _O_,_O_-diethyl ester		Continental Oil Co.	1.0 .5 .25	[3/] 97[3/] 78	[3/] 80[3/] 62	4[2/] 66 68	0[2/] 20 61
25	50481	Propiophenone, 2-(1-aziridinyl)-2-methyl-		C. L. Stevens Wayne State Univ.	1.0 1.0 .5 .25 .1 .05	- - - - - -	- - - - - -	95 NO 98 95 90 89	67 0 91 83 77 76
26	50478	Butyrophenone, 2-(1-aziridinyl)-2-methyl-		do.	1.0	-	-	98	92
27	50779	Aziridine, 1-[(diethyl=amino)methyl]		PCRB	1.0	82	72	56	48
28	50413	Aziridine, 1-(2-aminoethyl)-		Interchemical Corp.	1.0	-	-	98	87

Table 1.--Monoaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies--Continued

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food Hatch	Fly food Pupae	Sugar Hatch	Sugar Pupae
				Without Substituents					
					Percent	Percent	Percent	Percent	Percent
29	23944	1-Aziridinepropioni=trile		Interchemical Corp.	5.0	-	-	16 4/	9 4/
					2.5	94	73	-	-
					1.0	95	90	-	-
					.1	95	90	-	-
30	50406	Aziridine, 1-acetyl-		do.	1.0	75	54	70	61
31	50890	Aziridine, 1-propionyl-		PCRB	1.0	98	79	100	78
32	50797	Aziridine, 1-(cyclopropyl=carbonyl)-		Abbott Laboratories	2.5	60	47	97	93
					1.0	84	50	46	45
33	50744	Aziridine, 1-benzoyl-		PCRB	1.0	95	80	56	38
34	50550	Aziridine, 1-o-toluoyl-		PCRB	2.5	92♂	85♂	0 5/	0
					1.0	97	67	3(99)	0 (0)
					.5	-	-	65(50)	59(29)
					.25	-	-	96(99)	86(84)
					.1	-	-	100 (95)	83(85)
35	50549	Aziridine, 1-m-toluoyl-		PCRB	5.0	-	-	2 3/	0
					2.5	87♂	79♂	-	-
					1.0	95	50	95	0
					.5	-	-	99	95
					.25	-	-	97	83
					.1	-	-	98	89
36	50548	Aziridine, 1-p-toluoyl-		PCRB	5.0	-	-	0 3/	0 3/
					2.5	96♂	86♂	-	-
					1.0	100	87	85(48)	0(0)
					.5	-	-	84(94)	11(0)
					.25	-	-	88(96)	55(66)
					.1	-	-	92(100)	71(95)
37	50738	Aziridine, 1-(o-chlorobenzoyl)-		PCRB	1.0	100	84	99	86

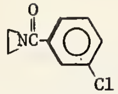
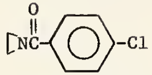
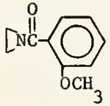
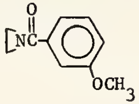
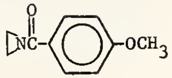
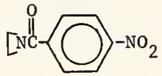
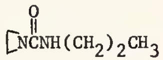
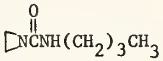
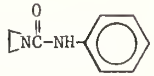
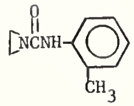
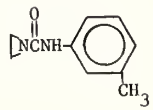
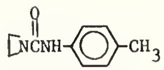
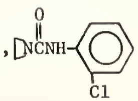
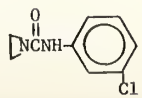
38	50737	Aziridine, 1-(*m*-chlorobenzoyl)-		PCRB	1.0	99	84	98	73
39	50407	Aziridine, 1-(*p*-chlorobenzoyl)-		Interchemical Corp.	1.0	93	82	50	33
40	50740	Aziridine, 1-*o*-anisoyl-		PCRB	1.0	100	84	90	43
41	50741	Aziridine, 1-*m*-anisoyl-		PCRB	1.0	98	76	90	23
42	50739	Aziridine, 1-*p*-anisoyl-		PCRB	5.0	-	-	80	75
					2.5	-	-	18	16
					1.0	83	63	21	19
43	50751	Aziridine, 1-(*p*-nitrobenzoyl)		Interchemical Corp.	5.0	0	0	-	-
					2.5	0	0	-	-
					2.5	84♂	82♂	93♂	86♂
					1.0	23	17	98	89
44	50170	1-Aziridinecarboxamide, *N*-propyl-		Chemirad Corp.	5.0	-	-	23	13
					2.5	-	-	30	11
					1.0	100	80	-	-
					1.0	-	-	2(2,4)	0(0,1)
					.5	-	-	2	0
					.25	-	-	36	30
					.1	-	-	86	71
					.05	-	-	98	88
45	50660	1-Aziridinecarboxamide, *N*-butyl-		PCRB	1.0	99	73	98	79
46	50169	1-Aziridinecarboxamide, *N*-octadecyl-		Chemirad Corp.	1.0	79(73)	73(42)	-	-
					1.0	-	-	99	90

Table 1.--Monoaziridinyl compounds without and with substituents on aziridinyl carbon ... source, and sterilization to house flies

Item	Entomology No. (ENT-)	Name	Structure	Source		:rilization at indicated insect stage with compound in-- Fly food h	Fly food Pupae	Sugar Hatch	Sugar Pupae
				Without Substituents					
					Percent	Percent	Percent	Percent	Percent
47	50171	1-Aziridinecarboxanilide		Chemirad Corp.	5.0	-	-	7	0
					2.5	-	-	76	0
					1.0	93	71	-	-
					1.0	-	-	0(12,0)	0(0,0)
					1.0	-	-	3(99)	0(77)
					.5	-	-	0	0
					.25	-	-	0	0
					.1	-	-	21	15
					.05	-	-	31	27
48	50685	1-Aziridinecarboxy-o-toluidide		PCRB	5.0	-	-	0	0
					2.5	-	-	0	0
					2.5	69♂	62♂	0♂	0♂
					1.0	6(44)	0(37)	12(3)	0(0)
					.5	79	64	91	13
					.25	85	76	80	62
					.1	97	84	97	91
					.05	96	86	100	87
49	50687	1-Aziridinecarboxy-m-toluidide		PCRB	5.0	0	0	-	-
					2.5	0	0	-	-
					2.5	21♂	17♂	1♂	0♂
					1.0	17	0	-	-
					1.0	-	-	21(12)	1(12)
					.5	-	-	22	18
					.25	97	86	84	76
					.1	98	88	97	85
					.05	97	91	97	81
50	50686	1-Aziridinecarboxy-p-toluidide		PCRB	5.0	0 2/	0 2/	-	-
					2.5	0	0	22	15
					1.0	8(95)	0(83)	8(78)	2(55)
					.5	94	79	46	46
					.25	-	-	91	82
					.1	98	94	99	94
					.05	-	-	97	81
51	50725	1-Aziridinecarboxanilide, 2'-chloro-		PCRB	1.0	89	86	95	80
52	50724	1-Aziridinecarboxanilide, 3'-chloro-		PCRB	1.0	97	89	97	97

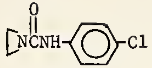
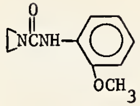
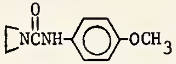
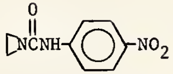
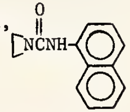
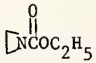
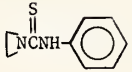
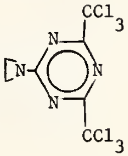
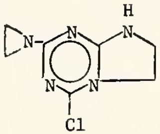
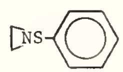
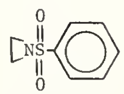
53	50723	1-Aziridinecarboxanilide, 4'-chloro-		PCRB	1.0	62 1/	54	35	35
54	50743	1-Aziridinecarbox-o-anisidide		PCRB	5.0 2.5 1.0	- - 100	- - 94	15 30 86	13 26 18
55	50742	1-Aziridinecarbox-p-anisidide		PCRB	5.0 5.0 2.5 1.0	- 0♂ - 88	- 0♂ - 61	0 1♂ 0 5	0 0♂ 0 3
56	50721	1-Aziridinecarboxanilide, 4'-nitro-		PCRB	1.0	88	87	92	83
57	50683	1-Aziridinecarboxamide, N-1-naphthyl-		PCRB	1.0	100	98	99	88
58	60257	1-Aziridinecarboxylic acid, ethyl ester		PCRB	1.0	98	88	99	98
59	50731	1-Aziridinecarboxanilide, thio-		Interchemical Corp.	1.0	94	87	67	66
60	50302	s-Triazine, 2-(1-aziridinyl)-4,6-bis(trichloromethyl)-		The Squibb Inst.	1.0	-	-	97	85
61	50789	Imidazo [1,2-a]-s-triazine, 2-(1-aziridinyl)-4-chloro-6,7-dihydro-		Sloan-Kettering Inst.	1.0	96	88	95	83

Table 1.--Monoaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies--Continued

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
				Without Substituents					
					Percent	Percent	Percent	Percent	Percent
62	50991	Phosphonic diamide, P-1-aziridinyl-N,N,N',N'-tetramethyl-	$[\!\!\!\!\!\text{NP(=O)N(CH}_3)_2 \text{ / } \text{N(CH}_3)_2$	PCRB	1.0 1.0 .5 .5 .25 .25 .1 .05	3/ - 30 - 81 - - -	3/ - 27 - 71 - - -	0 3/ 0(0,0)♂ 0 0(0,0)♂ 0 0(0,0)♂ 18 78	0 3/ 0(0,0)♂ 0 0(0,0)♂ 0 0(0,0)♂ 13 56
63	50418	Phosphonic acid, 1-aziridinyl-, diethyl ester	$\text{NP(=O)(OC}_2\text{H}_5)_2$	Interchemical Corp.	5.0 2.5 1.0 .5 .25 .1 .05	- - 18(10) - - - -	- - 1(4) - - - -	0 0 2(0) 15 22 81 96	0 0 0(0) 15 18 61 91
64	50310	Phosphonothioic acid, 1-aziridinyl-, O,O-diethyl ester	$\text{NP(=S)(OC}_2\text{H}_5)_2$	American Agricultural Chemical Co.	1.0	-	-	100	99
65	50829	Aziridine, 1-(phenyl=thio)-		P. E. Fanta, Ill. Inst. Technology	1.0 .5 .25	83 - -	67 - -	3/ 67 96	3/ 49 84
66	50705	Aziridine, 1-(phenyl=sulfonyl)-		Interchemical Corp.	1.0	99	93	99	87
				With Substituents					
67	50490	Aziridine, 1-ethyl-2-methylene-	$\text{CH}_2\text{=}[\!\!\!\!\!\text{NC}_2\text{H}_5$	Monsanto Chemical Co.	1.0 .5 .25	3/ 90 3/ 3/	 83 	3/ 95 3/ 5/ 86 6/	 56 82
68	50489	Aziridine, 1-tert-butyl-2-methylene-	$\text{CH}_2\text{=}[\!\!\!\!\!\text{NC(CH}_3)_3$	A. T. Bottini, Univ. Calif.	1.0	99	91	100	97
69	50484	1-Aziridineethanol, 2-methylene-α-vinyl	$\text{CH}_2\text{=}[\!\!\!\!\!\text{NCH}_2\text{CH(OH)CH=CH}_2$	do.	1.0	99	86	98	83

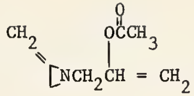
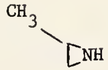
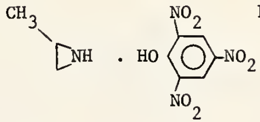
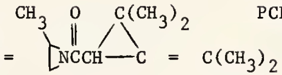
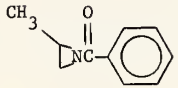
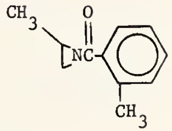
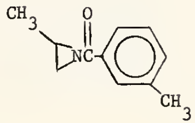
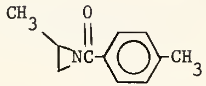
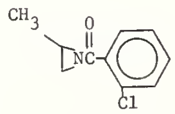
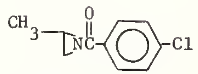
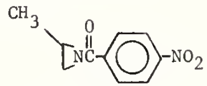
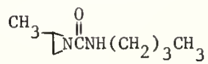
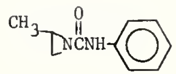
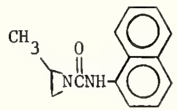
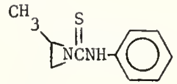
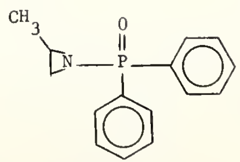
70	50786	1-Aziridineethanol, 2 methylene-α-vinyl-, acetate		A. T. Bottini Univ. Calif.	1.0	84	81	97	87
71	50325	Aziridine, 2-methyl-		Commercial	1.0 1.0	- -	- -	96 29[1/]	83 14[1/]
72	50370	Aziridine, 2-methyl-, picrate		PCRB	1.0 1.0	- -	- -	99 100	78 91
73	32954	Aziridine, 1-[[2,2-di= methyl-3-(2-methyl= propenyl)cyclopropyl]= carbonyl]-2-methyl-		PCRB	1.0	-	-	89	81
74	50745	Aziridine, 1-benzoyl= 2-methyl-		PCRB	1.0	98	83	99	91
75	50551	Aziridine, 2-methyl- 1-o-toluoyl-		PCRB	1.0	100	92	100	79
76	32893	Aziridine, 2-methyl- 1-m-toluoyl-		PCRB	1.0 1.0 1.0 .1	100 95 - 95	80 90 - 90	- - 100 -	- - 79 -
77	50552	Aziridine, 2-methyl- 1-p-toluoyl-		PCRB	1.0	99	11	83	73

Table 1.--Monoaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies--Continued

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
With Substituents									
					Percent	Percent	Percent	Percent	Percent
78	32955	Aziridine, 1-(o-chlorobenzoyl)-2-methyl-		PCRB	1.0 1.0	- -	- -	98 97	75 89
79	50706	Aziridine, 1-(p-chlorobenzoyl)-2-methyl-		Interchemical Corp.	1.0	58	30	94	79
80	50749	Aziridine, 2-methyl-1-(p-nitrobenzoyl)-		do.	1.0	99	94	97	93
81	50662	1-Aziridinecarboxamide, N-butyl-2-methyl-		PCRB	1.0	100	80	100	89
82	50701	1-Aziridinecarbox=anilide, 2-methyl-		Interchemical Corp.	2.5 1.0	- 56	- 44	57 57	30 19
83	50684	1-Aziridinecarboxamide, 2-methyl-N-1-naphthyl-		PCRB	1.0	94	88	100	84
84	50732	1-Aziridinecarbox=anilide, 2-methyl=thio-		Interchemical Corp.	1.0	98	82	85	62
85	50414	Phosphine oxide, (2=methyl-1-aziridinyl)=diphenyl-		do.	1.0	-	-	100	96

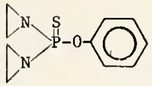
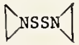
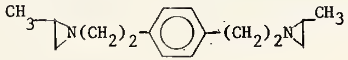
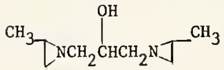
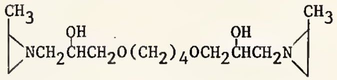
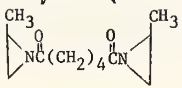
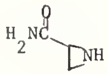
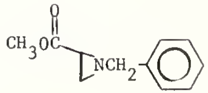
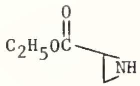
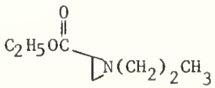
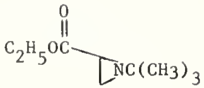
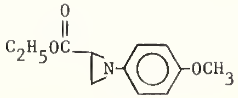
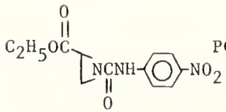
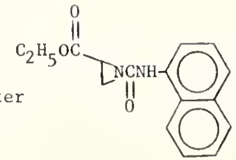
86	50043	Phosphinothioic acid, bis(1-aziridinyl)-, O-phenyl ester		American Agricultural Chemical Co.	1.0 0.1	NO1/ 95 1/	0 90	98 --	74 --
87	50357	Aziridine, 1,1'-sulfinylbis-		PCRB	1.0	52	40	20	20
88	50360	Aziridine, 1,1'-dithiobis-		PCRB	2.5 1.0 1.0 0.5 .25 .1 .05	1/ 0(100) -- 100 -- 100 100	1/ 0(23) -- 77 -- 68 80	-- 0(96) 31 93(43) 95 89 99	-- 0(84) 23 84(43) 82 85 92
				With Substituents					
89	50416	Aziridine, 1,1'-(p-phenylene= diethylene)= bis[2-methyl-		Interchemical Corp.	1.0 0.5 .25 .1 .05	NO(100) 100 98 99 100	0(51) 69 71 82 90	85 90 70 87 97	4 82 52 76 89
90	50405	2-Propanol, 1,3-bis(2-methyl-1-aziridinyl)-		do	1.0	93	67	90	61
91	26612	1-Aziridine= ethanol,α,α'-[tetra= methylene= bis(oxymethyl= ene)]bis[2-methyl-		do	1.0 0.1	95 95	90 90	-- --	-- --
92	50422	Aziridine, 1,1'-carbonylbis= [2-methyl-		do	1.0	95	70	80	60
93	50411	Aziridine, 1,1'-oxalylbis[2-methyl-		do	1.0	--	--	98	89
94	50129	Aziridine, 1,1'-adipoylbis= [2-methyl-		do	1.0 0.1	95 95	90 90	-- --	-- --

Table 1.--Monoaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food Hatch	Fly food Pupae	Sugar Hatch	Sugar Pupae
			With Substituents						
					Percent	Percent	Percent	Percent	Percent
95	50911	2-Aziridinecarboxamide		PCRB	1.0 1.0 .5 .25	0 93(87)♂ 60 86	0 0(78)♂ 32 53	0 70♂ 17 42	0 42♂ 16 30
96	50609	2-Aziridinecarboxylic acid, 1-benzyl-, methyl ester		PCRB	1.0	79	64	95	89
97	50682	2-Aziridinecarboxylic acid, ethyl ester		PCRB	1.0	93	79	98	94
98	50719	2-Aziridinecarboxylic acid, 1-propyl-ethyl ester		PCRB	1.0	46	34	58	42
99	50717	2-Aziridinecarboxylic acid, 1-*tert*-butyl-, ethyl ester		PCRB	1.0	94	92	89	83
100	50718	2-Aziridinecarboxylic acid, 1-(*p*-methoxy-phenyl)-, ethyl ester		PCRB	1.0	67	60	93	76
101	50722	2-Aziridinecarboxylic acid, 1-[*p*-nitrophenyl)= carbamoyl]-, ethyl ester		PCRB	1.0	84	70	97	88
102	50755	2-Aziridinecarboxylic acid, 1-(1-naphthyl= carbamoyl)-, ethyl ester		PCRB	1.0	93	91	65	50

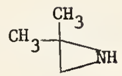
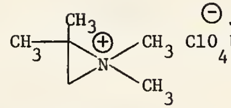
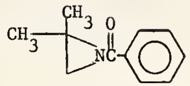
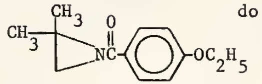
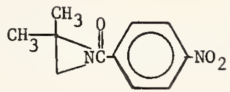
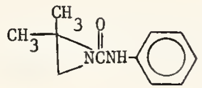
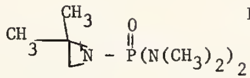
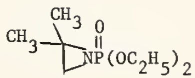
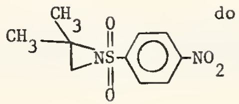
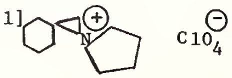
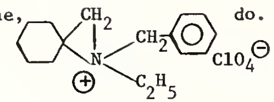
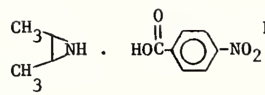
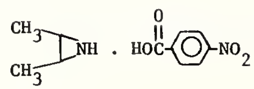
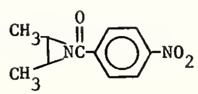
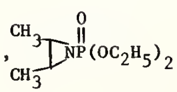
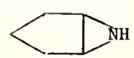
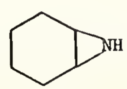
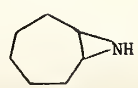
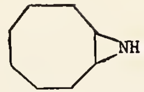
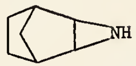
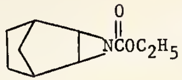
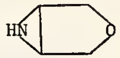
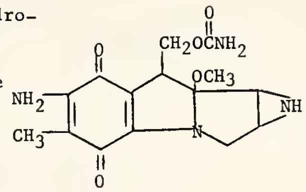
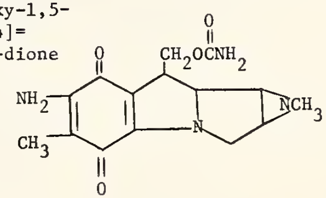
103	50669	Aziridine, 2,2-dimethyl-		Commercial	1.0	-	-	96[1]	90[1]
104	50944	Aziridinium, 1,1,2,2 tetramethyl----per= chlorate		J. Paukstelis, Univ. Ill.	1.0	93	86	61	22
105	50401	Aziridine, 1-benzoyl 2,2-dimethyl		Interchemical Corp.	1.0	-	-	100	86
106	50412	Aziridine, 1-(p-ethoxy= benzoyl)-2,2-dimethyl		do.	1.0	-	-	97	85
107	50400	Aziridine, 2,2-dimethyl 1-(p-nitrobenzoyl)		do.	1.0	-	-	96	80
108	50733	1-Aziridinecarboxani= lide, 2,2-dimethyl		do.	1.0	94	86	96	85
109	60184	Phosphonic diamide, P (2,2-dimethyl-1-azi= ridinyl)-N,N,N',N' tetramethyl		PCRB	1.0 ,5 .25	[3] [4]38 79	[3] [4]30 40	[3] [4]86 89	[3] [4]61 81
110	50709	Phosphonic acid, (2,2 dimethyl-1-aziridinyl)-, diethyl ester		Interchemical Corp.	1.0	95	86	90	82
111	50421	Aziridine, 2,2-dimethyl 1-[(p-nitrophenyl)= sulfonyl]		do.	1.0	-	-	91	74

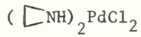
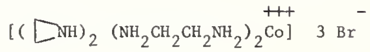
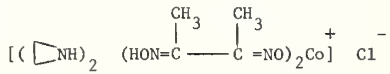
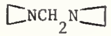
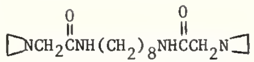
Table 1.--Monoaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies--Continued

Item	Entomology No. (ENT-)	Name	Structure	Source	Concen-tration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
			With Substituents						
					Percent	Percent	Percent	Percent	Percent
112	50946	5-Azoniadispiro [4.0.5.1] dodecane----per=chlorate		J. Paukstelis, Univ. Ill.	1.0	72	62	85	73
113	50945	1-Azoniaspiro [2.5] octane, 1-benzyl-1-ehtyl----perchlorate		do.	1.0	93	88	88	67
114	60213	Aziridine, *cis*-2,3-dimethyl-, *p*-nitro=benzoate	 cis	PCRB	1.0	93	88	91	81
115	60212	Aziridine, *trans*-2,3-dimethyl-, *p*-nitro=benzoate	 trans	PCRB	1.0	67	67	84	77
116	50750	Aziridine, 2,3-di=methyl-1-(*p*-nitro=benzoyl)		Interchemical Corp.	1.0	69	56	98	92
117	50711	Phosphonic acid, (2,3-dimethyl-1-aziridinyl)-, diethyl ester		do.	1.0	96	90	100	95
118	50920	6-Azabicyclo[3.1.0]hexane		PCRB	1.0	81	71	87	87
119	50902	7-Azabicyclo[4.1.0]heptane		PCRB	1.0 1.0 .5	98 - -	83 - -	93 98 88	0 92 83
120	50919	8-Azabicyclo[5.1.0]octane		PCRB	1.0	88	75	89	77

121	50482	9-Azabicyclo[6.1.0]nonane		P. E. Fanta Ill. Inst. Technology	1.0	-	-	99	88
122	51297	3-Azatricyclo[3.2.1.0^{2,4}]= octane		PCRB	1.0	94	91	66	63
123	51296	3-Azatricyclo[3.2.1.0^{2,4}]= octane-3-carboxylic acid, ethyl ester		PCRB	5.0	98	75	-	-
					2.5	94	76	-	-
					1.0	96	13	78	73
					1.0	92♂	86♂	-	-
124	51235	3-Oxa-6-azabicyclo= [3.1.0]hexane		PCRB	1.0	77	67		
125	26199	Carbamic acid, ester certh= 6-amino-1,1a,2,8,8a,8b-hexahydro-8-(hydroxymethyl)-8a-methoxy-5-methylazirino[2',3':3,4]= pyrrolo[1,2-a]indole-4,7-dione (Mitomycin C)		CCNSC	1.0	-	-	3/	3/
					1.0	-	-	0	0
					.5	-	-	14	14
					.25	-	-	100	68
					.1	-	-	85	54
					.05	-	-	99	64
126	50825	Carbamic acid, ester urth 6-amino-1,1a,2,8,8a,8b-hexahydro-8-(hydroxymethyl)-8a-methoxy-1,5-dimethylazirino[2',3':3,4]= pyrrolo[1,2-a]indole-4,7-dione (Porfiromycin)		The Upjohn Co.	5.0	0	0		
					5.0	0(0)(0)♂	0(0)(0)♂	-	-
					2.5	0	0	-	-
					2.5	0(0)(11)♂	0(0)(10)♂	-	-
					1.0	0	0	4	1
					.5	0	0	0	0
					.25	0	0	0	0
					.1	80	71	0	0
					.1	0	0	2♂	0♂
					.1	-	-	0(0)(0)♂	0(0)(0)♂
					.05	0(35)	0(25)	0	0
					.025		21(56)	25(76)	10(74)
					.01	29	24	69	50

1/ Compound administered in sugar water.
2/ Mortality 20-40 percent.
3/ Mortality 81-100 percent.
4/ Mortality 41-60 percent.
5/ Low oviposition.
6/ Mortality 61-80 percent.

Table 2.--Diaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies--Continued

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
			Without Substituents						
					Percent	Percent	Percent	Percent	Percent
1	50881	Palladium, _trans_ dichloro-bis=(ethylenimine)=		PCRB	1.0	100	76	100	82
2	50874	Cobalt, bis(ethyl=enediamine)bis=(ethylenimine)----tribromide		PCRB	1.0	71	29	88	74
3	50872	Cobalt, bis(dimethyl=gloyoximato)bis=(ethylenimine)----chloride		PCRB	2.5	73♂	62♂	-	-
					1.0	0	0	8	2
					1.0	-	-	45	29
					.5	52	32	85	65
					.25	4	4	-	-
					.25	50	47	-	-
					.1	82	61	-	-
4	50752	Aziridine, 1,1'=methylenebis-		PCRB	1.0	99	92	28	28
5	51617	1-Aziridineaceta=mide, _N_,_N_'-octamethylene=bis-		Stanford Research Inst.	1.0	0	0	0	0
					1.0	8(0)♂	8(0)♂	1(0)♂	1(0)♂
					.5	0	0	2	0
					.5	14(10)♂	11(9)♂	2(9)♂	2(6)♂
					.25	0	0	26	10
					.25	31(41)♂	22(35)♂	22(29)♂	20(27)♂
					.1	10	9	-	-
					.05	41	33	-	-

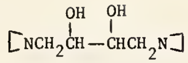
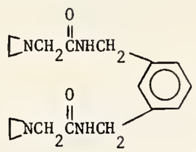
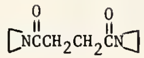
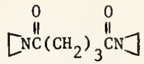
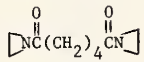
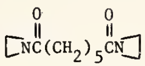
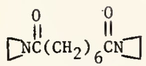
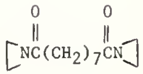
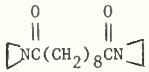
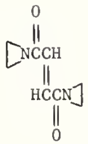
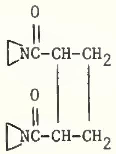
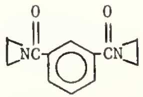
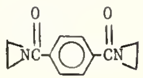
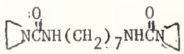
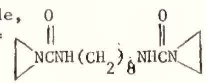
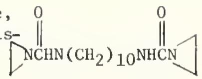
6	50693	2,3-Butanediol, 1,4-bis(1-aziridinyl)-, <u>meso</u>-		CCNSC	1.0	97	90	76	47
7	51616	1-Aziridineaceta= mide, <u>N</u>,<u>N</u>'-(<u>m</u>-phenylenedimethyl= ene)bis-		Stanford Research Inst.	1.0 .5 .25	40 81 77	40 79 61	41 80 81	38 51 58
8	50888	Aziridine, 1,1'-oxalylbis-		PCRB	1.0	100	70	100	48
9	50613	Aziridine, 1,1'-succinylbis-		PCRB	1.0	97	92	97	62
10	50615	Aziridine, 1,1'-glutarylbis-		PCRB	1.0	94	61	99	84
11	50610	Aziridine, 1,1'-adipoylbis-		PCRB	5.0 2.5 1.0 1.0 .5 .25 .1 .05	- - 79 - 0 - - -	- - 52 - 0 - - -	0[1/] [1/] 56(88) 98 5(89) 99(96) 100(100) 98(100)	0 0(21) 0 5(11) 84(23) 82(56) 91(76)
12	50614	Aziridine, 1,1'-pimeloylbis-		PCRB	2.5 1.0	- 99	- 90	62 50	62 32
13	50889	Aziridine, 1,1'-suberoylbis-		PCRB	1.0	100	82	100	77

Table 2.--Diaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
				Without Substituents					
					Percent	Percent	Percent	Percent	Percent
14	50611	Aziridine, 1,1'-azelaoylbis-		PCRB	2.5	-	-	0	0
					1.0	67	44	1♂	1♂
					1.0	-	-	3(85)	0(6)
					.5	-	-	95(0)	79(0)
					.25	-	-	87(8)	61(6)
					.1	-	-	100(92)	74(28)
					.05	-	-	95	42
15	50612	Aziridine, 1,1'-sebacoylbis-		PCRB	2.5	-	-	0	0
					2.5	2/ 42	42	-	-
					2.5	98	0	-	-
					1.0	42	19	71	36
16	50616	Aziridine, 1,1'-fumaroylbis-		PCRB	5.0	6	3	6	4
					2.5	0	0	0	0
					1.0	50	0	0	0
					.5	0	0	7	0
					.25	98	69	9	0
					.1	100	91	86	13
					.05	100	71	98	38
17	50720	Aziridine, 1,1'-(1,2-cyclobutylenedi=carbonyl)bis-		PCRB	1.0	97	83	72	61
18	50529	Aziridine, 1,1'-iso=phthaloylbis-		PCRB	5.0	-	-	26	24
					1.0	81	66	1	0
					.5	-	-	92	78
					.25	-	-	90	78
19	50526	Aziridine, 1,1'-terephthaloylbis-		PCRB	1.0	62	48	88	73

20	50838	1-Aziridinecarboxa= mide, N,N'-tetra= methylenebis-	$[\text{NC(=O)NH(CH}_2)_4\text{NHC(=O)N}]$	The Squibb Inst.	1.0	NO1/	-	NO1/	-
					.5	NO1/	-	-	-
					.25	NO	-	NO1/	-
					.1	34	29	NO	-
					.05	45	29	0	0
					.05	-	-	0(0)(3)♂	0(0)(0)♂
					.025	-	-	0	0
					.025	-	-	2(0)(0)♂	0(0)(0)♂
					.01	-	-	23	4
					.005	-	-	21	13
21	50840	1-Aziridinecarboxamide, N,N'-pentamethylene= bis-	$[\text{NC(=O)NH(CH}_2)_5\text{NHC(=O)N}]$	do	1.0	0	1/0	-	-
					1.0	0(0)(0)♂	0(0)(0)♂	-	-
					.5	0	1/0	NO1/	-
					.5	0(0)♂	0(0)♂	-	-
					.25	0	0	NO	-
					.25	4(0)♂	4(0)♂	-	-
					.1	14	14	10	0
					.1	44♂	37♂	0(0)(0)♂	0(0)(0)♂
					.05	80	66	0	0
					.05	-	-	0(0)(0)♂	0(0)(0)♂
					.25	-	-	0	0
					.25	-	-	0(0)(0)♂	0(0)(0)♂
					.01	-	-	0	0
					.01	-	-	0(0)(0)♂	0(0)(0)♂
					.005	-	-	11	6
					.005	-	-	0(0)(0)♂	0(0)(0)♂
					.0025	-	-	0	0
					.0025	-	-	0(0)(0)♂	0(0)(0)♂
					.001	-	-	0	0
					.001	-	-	0(0)(0)♂	0(0)(0)♂
					.0005	-	-	66	64
22	50172	1-Aziridinecar= boxamide, N,N'- hexamethylenebis-	$[\text{NC(=O)NH(CH}_2)_6\text{NHC(=O)N}]$	Chemirad Corp.	5.0	1/	1/	-	-
					2.5	1/	1/	-	-
					1.0	0	0	1/	1/
					1.0	NO1/	0	NO1/	0
					1.0	NO	0	-	-
					.5	NO3/	0	0	0
					.5	6	3	-	-
					.25	2(100)	0(72)	NO	-
					.1	95(99)	21(72)	0	0
					.1	-	-	NO♂	0
						-	-	NO♂	0
						-	-	NO♂	0
					.05	93(98)	14(82)	0	0
					.025	-	-	1	0
					.01	-	-	53	29

Table 2.--Diaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
			Without Substituents						
					Percent	Percent	Percent	Percent	Percent
23	50841	1-Aziridinecarboxamide, N,N'-heptamethylene= bis-		The Squibb Inst.	1.0	0[4/]	0	NO[3/]	0
					1.0	0(0)(0)♂	0(0)(0)♂	--	--
					0.5	0	0	0[3/]	0
					.5	2(0)♂	2(0)♂	0(0)(0)♂	0(0)(0)♂
					.25	0	0	0[4/]	0
					.25	0(4)♂	0(2)♂	0(2)(0)♂	0(0)(0)♂
					.1	69	60	0	0
					.1	--	--	0(0)(0)♂	0(0)(0)♂
					.05	85	84	0	0
					.05	--	--	0(0)(0)♂	0(0)(0)♂
					.025	--	--	0	0
					.025	--	--	0(22)(9)♂	0(20)(6)♂
					.01	--	--	0	0
					.01	--	--	3(0)(12)♂	0(0)(11)♂
					.005	--	--	0	0
					.005	--	--	0(0)(0)♂	0(0)(0)♂
					.001	--	--	96	82
					.0025	--	--	2	2
					.0025	--	--	0(0)(77)♂	0(0)(61)♂
24	50839	1-Aziridinecarboxamide, N,N'-octamethylene= bis		do	1.0	0	0	54[4/]	0
					1.0	--	--	0(0)(0)♂	0(0)(0)♂
					0.5	0	0	0	0
					.5	0(0)♂	0(0)♂	0(0)♂	0(0)♂
					.25	0	0	0	0
					.25	2(7)♂	2(7)♂	NO(0)♂	(0)♂
					.1	24	24	0	0
					.1	--	--	0(0)(0)♂	0(0)(0)♂
					.05	87	72	0	0
					.05	--	--	0(0)(0)♂	0(0)(0)♂
					.025	--	--	0	0
					.025	--	--	13(0)(0)♂	7(0)(0)♂
					.01	--	--	0	0
					.01	--	--	3(41)(0)♂	0(31)(0)♂
					.005	--	--	42	34
					.0025	--	--	0	0
					.0025	--	--	18(12)(36)♂	10(3)(27)♂
					.001	--	--	78	63
25	50321	1-Aziridinecarboxamide, N,N'-decamethylenebis-		do	5.0	--	--	0	0
					2.5	--	--	0	0
					1.0	94(30)	52(30)	0	0
					0.5	12	12	--	--
					.25	55	46	--	--
					.1	30	27	--	--
					.05	63	52	--	--

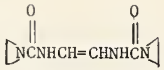
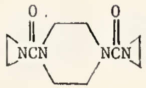
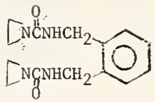
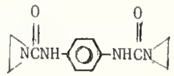
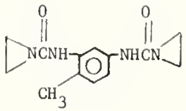
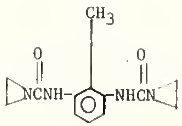
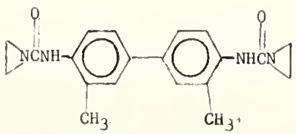
26	50987	1-Aziridinecarboxamide, N,N'-trans-vinylenebis-		PCRB	1.0	NO4/	0	03/	0
					1.0	--	--	0(0)(3)♂	0(0)(0)♂
					0.5	0	0	0	0
					.5	0(0)(0)♂	0(0)(0)♂	0(0)(0)♂	0(0)(0)♂
					.25	12	0	0	0
					.25	0(0)(0)♂	0(0)(0)♂	0(0)(0)♂	0(0)(0)♂
					.1	40	0	0	0
					.05	0	0	0	0
					.025	0	0	84	82
					.01	0	0	84	77
					.01	--	--	0(0(0)♂1	0(0)(0)♂
					.005	96	94	--	--
					.0025	100	73	--	--
27	50791	Piperazine, 1,4-bis=(1-aziridinyl=carbonyl)-		Sloan-Kettering Research Inst.	1.0	NO4/	0	NO4/	0
					1.0	NO1/	0	NO1/	0
					0.5	NO	0	NO	0
					.25	NO	0	NO	0
					.1	0	0	NO	0
					.05	46	25	NO	0
					.025	0	0	NO	0
					.01	--	--	0	0
					.01	0♂	0♂	1♂	0♂
					.005	--	--	0	0
					.0025	--	--	14	14
28	50174	1-Aziridinecarboxamide, N,N'-(o-phenylenedi=methylene)bis-		Chemirad Corp.	5.0	--	--	0	0
					2.5	--	--	NO	0
					1.0	0	0	e	e
					1.0	0♂	0♂	0♂	0♂
					1.0	0	0	--	--
					0.5	14	9	NO	0
					,25	79	24	2	0
					.1	98	69	0	0
					.05	100	76	0	0
					.025	--	--	0	0
					.01	--	--	62	43

Table 2.--Diaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies--Continued

Item	Entomology No. (ENT-)	Name	Structure	Source	Concen- tration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
				Without Substituents					
					Percent	Percent	Percent	Percent	Percent
29	50848	1-Aziridinecarboxamide, N,N'-p-phenylenebis-		The Squibb Inst.	1.0	0	0	0	0
					1.0	0(0)(0)♂	0(0)(0)♂	0(0)(6)♂	0(0)(0)♂
					0.5	5	0	0	0
					.5	27o	27♂	0(0)♂	0(0)♂
					.25	64	38	0	0
					.25	--	--	0(0)♂	0(0)♂
					.1	--	--	0	0
					.1	--	--	0(0)(0)♂	0(0)(0)♂
					.05	--	--	0	0
					.05	--	--	4(5)(20)♂	0(2)(10)♂
					.025	--	--	0	0
					.01	--	--	0	0
					.005	--	--	0	0
					.005	--	--	5(7)(8)♂	3(5)(8)♂
					.0025	--	--	7	5
					.0025	--	--	0(14)(18)♂	0(6)(16)♂
					.001	--	--	43	34
30	50173	1-Aziridinecarboxamide, N,N'-(4-methyl-m-phenylenebis-		Chemirad Corp.	5.0	--	--	0(1[1/])	0(0[1/])
					2.5	--	--	4	0
					1.0	85(0)	0(0)	NO(0)	0(0)
					0.5	3	0	0	0
					.25	4	0	0	0
					.1	77	38	0(0)	0(0)
					.05	100	63	0	0
					.025	--	--	66	4
					.01	--	--	59	46
31	50842	1-Aziridinecarboxamide, N,N'-(2-methyl-m-phenylenebis-			1.0	8	0	0	0
					1.0	3(0)(0)♂	0(0)(0)♂	0(0)(0)♂	0(0)(0)♂
					0.5	0	0	0	0
					.5	NO(0)♂	0(0)♂	0(0)♂	0(0)♂
					.25	0	0	0	0
					.25	0(0)♂	0(0)♂	0(0)♂	0(0)♂
					.1	62	45	2	0
					.1	--	--	0(0)(0)♂	0(0)(0)♂
					.05	88	67	0	0
					.05	--	--	0	0♂
					.025	--	--	12	8
					.01	--	--	72	47
32	50661	4',4'''-Bi[1-aziridine= carboxy-o-toluidide]		PCRB	1.0	96	85	88	73

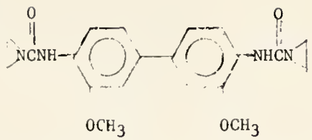
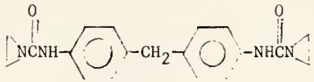
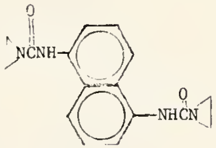
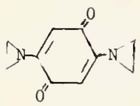
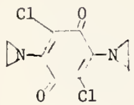
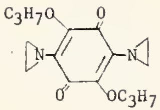
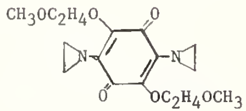
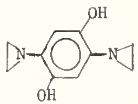
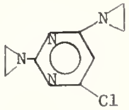
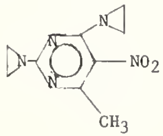
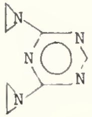
33	50665	4',4'''Bi[aziridine= carbox-o-anisidide]		PCRB	5.0 2.5 2.5 1.0	-- -- 55σ 59	-- -- 53σ 48	0 0 30o 15	0 0 16o 12
34	50175	1-Aziridinecarbox= anilide, 4',4'''- methylenebis-		PCRB	1.0 1.0 0.5 .25 .1 .05	99 -- -- -- -- --	62 -- -- -- -- --	3 1/ 1/ 0 62 74	0 1/ 1/ 0 28 49
35	50664	1-Aziridinecarbox= amide, N,N'-1,5- naphthylenebis-		PCRB	5.0 2.5 2.5 1.0 0.5 .25 .1 .05	16 6 -- 0 8(0) 86(0) 95(63) 48	0 0 -- 0 5(0) 58(0) 58(29) 38	0 0 45σ 0 10(0) 18(0) 26(33) 14	0 0 33σ 0 2(0) 17(0) 21(23) 14
36	50702	p-Benzoquinone, 2,5- bis(1-aziridinyl)-		PCRB	5.0 2.5 1.0 0.5 .1 .05	9 1/ 10 4/ 5(0) 12 100 100	9 1/ 1 4/ 0(0) 5 88 87	-- -- 94 -- -- --	-- -- 69 -- -- --
37	50729	p-Benzoquinone, 2,5- bis(1-aziridinyl)- 3,6-dichloro-		Interchemical Corp.	1.0	81	70	90	80
38	26324	p-Benzoquinone, 2,5- bis(1-aziridinyl)- 3,6-dipropoxy-		CCNSC	5.0 2.5 1.0 0.5 .25 .1	NO 1/ 5/ 13 3/ 0 95 95 95	0 0 0 0 0 90	-- -- -- -- -- --	-- -- -- -- -- --

Table 2.--Diaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies--Continued

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
				Without Substituents					
					Percent	Percent	Percent	Percent	Percent
39	26382	p-Benzoquinone, 2,5-bis(1-aziridinyl)-3,6-bis(2-methoxy-ethoxy)-		CCNSC	5.0	[1]	[1]	--	--
					2.5	NO[1]	0	--	--
					1.0	--	--	NO[5]	0
					1.0	95	0	NO	0
					0.5	95	0	NO[4]	0
					.25	95	0	1	0
					.1	95	90	0	0
					.1	--	--	0(9)♂	0(7)♂
40	50677	Hydroquinone, 2,5-bis(1-aziridinyl)-		PCRB	5.0	0	0	--	--
					2.5	20	20	--	--
					1.0	3(93)	0(50)	0(21)	0(16)
					0.5	89	52	75	43
					.25	97	93	96	78
41	23945	Pyrimidine, 2,4-bis(1-aziridinyl)-6-chloro-		Commercial	1.0	0	--	0	0
					1.0	90♂	89♂	31♂	31♂
					0.5	20	20	0	0
					.25	71	62	0	0
					.1	73	67	--	--
					.05	81	71	--	--
42	50330	Pyrimidine, 2,4-bis(1-aziridinyl)-6-methyl-5-nitro-		CCNSC	5.0	--	--	1	0
					1.0	0(0)	0(0)	6	0
					1.0	5	0	--	--
					0.5	0(99)	0(12)	0	0
					.25	3(5)	0(3)	100	0
					.1	6(12)	0(12)	0	0
					.05	95(56)	53(36)	2	0
					.025	--	--	22	17
					.01	--	--	99	93
43	50790	s-Triazine, 2,4-bis(1-aziridinyl)-		Sloan-Kettering Research Inst.	5.0	NO[1]	0	--	--
					1.0	17	0	NO	0
					0.5	7	0	0	0
					.25	40	0	70	0
					.1	0	0	0	0
					.05	62	26	0	0
					.025	--	--	0	0
					.01	--	--	0	0
					.005	--	--	41	34
					.0025	--	--	90	72

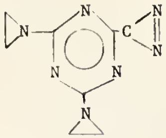
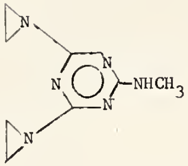
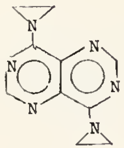
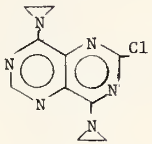
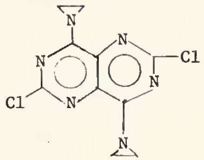
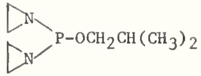
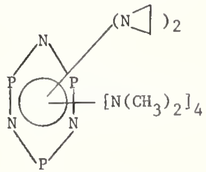
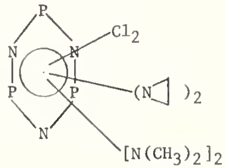
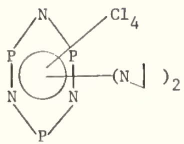
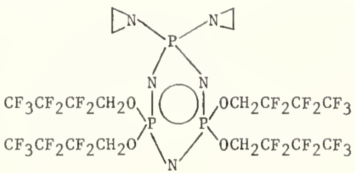
44	50301	s-Triazine, 2,4-bis=(1-aziridinyl)-6-(diazomethyl)-		The Squibb Instit.	1.0	100	92	89	79
45	50876	s-Triazine, 2,4-bis=(1-aziridinyl)-6-(methylamino)-		Sloan-Kettering Inst.	1.0	1/	1/	1/	1/
					0.5	NO	0	1/	1/
					.25	0	0	0	0
					.1	15	0	0	0
					.1	86♂	80♂	0(0)(0)♂	0(0)(0)♂
					.05	75	57	04/	04/
					.05	--	--	0(0)(0)♂	0(0)(0)♂
					.025	--	--	0	0
					.025	--	--	0(0)♂	0(0)♂
					.01	--	--	0	0
					.01	--	--	2(0)♂	0(0)♂
					.005	--	--	34	27
					.0025	--	--	42	31
46	50792	Pyrimido[5,4-d]=pyrimidine, 4,8-bis=(1-aziridinyl)-		do	5.0	0	0	--	--
					1.0	0	0	0	0
					1.0	0♂	0♂	0♂	0♂
					0.5	0	0	13	12
					.25	0	0	13	13
					.1	90	14	--	--
					.05	52	27	--	--
47	50878	Pyrimido[5,4-d]=pyrimidine, 4,8-bis(1-aziridinyl)-2-chloro-		C. H. Boehringer Sohn	1.0	64	28	76	51
48	50879	Pyrimido[5,4-d]=pyrimidine, 4,8-bis(1-aziridinyl)-2,6-dichloro-		do	1.0	84	81	94	81

Table 2.--Diaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies--Continued

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
			Without Substituents						
					Percent	Percent	Percent	Percent	Percent
49	50847	Aziridine, 1,1'-thiocarbonylbis-		Interchemical Corp.	1.0	NO	0	95	83
					0.5	95	84	--	--
50	50045	Phosphinous acid, bis(1-aziridinyl)-, isobutyl ester		American Agricultural Chemical Co.	1.0	95	90	--	--
					0.1	95	90	--	--
51	50442	1,3,5,2,4,6-Triaza=triphosphorine, bis(1-aziridinyl)=tetrakis(dimethyl=amino)-2,2,4,4,6,6=hexahydro-		The Squibb Inst.	1.0	NO(88)	0(75)	81	46
					0.5	97	87	--	--
					.25	90	79	--	--
52	50326	1,3,5,2,4,6-Triaza-triphosphorine, bis=(1-aziridinyl)=dichlorobis(dimethyl=amino)-2,2,4,4,6,6=hexahydro-		do	1.25	56	2	--	--
					1.0	9	4	90	69
53	50304	1,3,5,2,4,6-Triaza=triphosphorine, bis(1-aziridinyl)=tetrachloro-2,2,4,=4,6,6-hexahydro-		do	1.0	--	--	97(87)	86(86)
54	50061	1,3,5,2,4,6-Triaza=triphosphorine, 2,2-bis(1-aziri=dinyl)-4,4,6,6-tetrakis(2,2,3,=3,4,4,4-hepta=fluorobutoxy)-2,2,4,4,6,6-hexahydro-		Olin Mathieson	1.0	95	90	--	--
					0.5	95	90	--	--
					.25	95	90	--	--
					.1	95	90	--	--

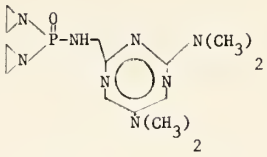
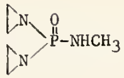
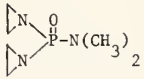
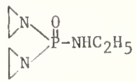
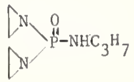
55	51091	Phosphonic amide, P,P-bis(1-aziri=dinyl)-N-[4,6-bis(dimethyl=amino)-s-triazin-2-yl]-		PCRB	1.0	0	0	0	0
					1.0	0(0)(0)♂	0(0)(0)♂	0(NO)(0)♂	0(-)(0)♂
					0.5	0	0	0	0
					.5	0(37)♂	0(16)♂	0(0)♂	0(0)♂
					.25	5	0	0	0
					.25	0(0)♂	0(0)♂	0(0)♂	0(0)♂
					.1	84	78	0	0
					.1	--	--	0♂	0♂
					.05	91	90	14	14
56	51254	Phosphonic amide, P,P-bis(1-aziri=dinyl)-N-methyl-		do	1.0	1/	1/	1/	1/
					0.5	01/	0	01/	0
					.25	03/	0	01/	0
					.25	0(0)(0)♂	0(0)(0)♂	--	--
					.1	64	56	1/	1/
					.05	94	88	NO4/	0
					.025	--	--	0	0
					.025	--	--	0(0)(0)♂	0(0)(0)♂
					.01	--	--	0	0
					.01	--	--	0(0)(0)♂	0(0)(0)♂
					.005	--	--	0	0
					.005	--	--	0(0)(0)♂	0(0)(0)♂
					.0025	--	--	3	3
					.0025	--	--	8♂	7♂
					.001	--	--	86	71
					.001	--	--	92♂	90♂
					.0005	--	--	97	93
					.0005	--	--	93♂	88♂
57	50990	Phosphonic amide, P,P-bis(1-aziri=dinyl)-N,N-dimethyl-		do	1.0	04/	0	NO3/	0
					1.0	8(0)(0)♂	0(0(0)♂		
					0.5	0	0	0	0
					.5	0(0)(82)♂	0(0)(73)♂	0(0)(0)♂	0(0)(0)♂
					.25	34	34	0	0
					.25	--	--	0(0)(0)♂	0(0)(0)♂
					.1	--	--	0	0
					.05	--	--	63	0
					.025	--	--	0	0
					.025	--	--	11♂	11♂
					.01	--	--	0	0
					.01	--	--	26♂	12♂
					.005	--	--	84	80
					.0025	--	--	98	88

Table 2.--Diaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
				Without Substituents					
					Percent	Percent	Percent	Percent	Percent
58	50787	Phosphonic amide, P,P-bis(1-aziridinyl)-N-ethyl-		E. Kuh, Rutgers Univ.	5.0	NO1/	0	--	--
					1.0	NO3/	0	NO4/	0
					0.5	NO3/	0	NO5/	0
					.25	8	0	NO3/	0
					.1	0	0	0	0
					.1	--	--	68	64♂
					.05	0	0	NO4/	0
					.025	30	24	0	0
					.01	70	66	0	0
					.005	--	--	0	0
					.005	--	--	0(0)(0)♂	0(0)(0)♂
					.0025	--	--	5	5
					.0025	--	--	1/	
					.001	--	--	NO1/	0
					.0005	--	--	0	0
					.00025	--	--	0	0
					.00025	--	--	0(0)(NO)♂	0(0)(-)♂
					.0001	--	--	96	86
					.00005	--	--	96	94
59	51253	Phosphonic amide, P,P-bis(1-aziridinyl)-N-propyl-		PCRB	1.0	1/	1/	1/	1/
					0.5	01/	0	1/	1/
					.25	0	0	1/	1/
					.25	--	--	1(2)(1)♂	0(0)(0)♂
					.1	98	89	1/	1/
					.05	93	83	1/	1/
					.025	--	--	05/	0
					.01	--	--	0	0
					.01	--	--	0(1)(3)♂	0(0)(0)♂
					.005	--	--	49	36
					.0025	--	--	78	67

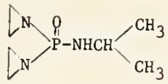
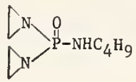
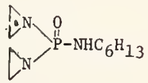
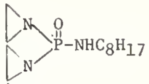
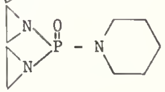
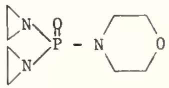
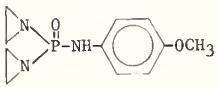
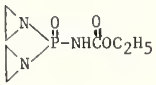
60	51256	Phosphonic amide, P,P-bis(1-aziridinyl)-N-isopropyl-		PCRB	1.0	1/	1/	1/	1/
					1.0	NO5/	0	1/	1/
					1.0	0(0)(0)♂	0(0)(0)♂	--	--
					0.5	0	0	1/	1/
					.5	0(0)(0)♂	0(0)(0)♂	--	--
					.25	0	0	1/	1/
					.25	0(0)(0)♂	0(0)(0)♂	NO4/	0
					.1	76	60	0	0
					.05	97	90	96♂	83♂
					.05	--	--	04/	0
					.025	--	--	0(0)(5)♂	0(0)(0)♂
					.025	--	--	1/	1/
					.01	--	--	0	0
					.005	--	--	2(6)(9)♂	2(5)(7)♂
					.005	--	--	0	0
					.0025	--	--	0(0)(0)♂	0(0)(0)♂
					.0025	--	--	91	81
					.001	--	--	87♂	82♂
					.001	--	--	67	65
					.0005	--	--		
61	51028	Phosphonic amide, P,P-bis(1-aziridinyl)-N-butyl-		E. Kuh, Rutgers Univ.	1.0	05/	0	01/	0
					0.5	0	0	0	0
					.5	0♂	0♂	0♂	0♂
					.25	30	29	0	0
					.1	--	--	0	0
					.1	--	--	0(0)(0)♂	0(0)(0)♂
					.05	--	--	0	0
					.05	--	--	0(0)(1)♂	0(0)(0)♂
					.025	--	--	2	2
					.025	--	--	1(3)(16)♂	0(1)(14)♂
					.01	--	--	34	25
					.01	--	--	68♂	38♂
					.005	--	--	85	71
					.005	--	--	52♂	43♂
					.0025	--	--	94	86
					.0025	--	--	75♂	43♂
62	51029	Phosphonic amide, P,P-bis(1-aziridinyl)-N-hexyl-		do	1.0	0	0	0	0
					1.0	0(0)(0)♂	0(0)(0)♂	0(0)(1)♂	0(0)(0)♂
					0.5	76	26	0	0
					.5	80♂	56♂	0(NO)(40)♂	0( )(35)♂
					.25	89	73	1	0
					.25	81♂	67♂	6(11)(6)♂	3(6)(4)♂
					.1	--	--	54	46
					.05	--	--	33	33

Table 2.--Diaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies--Continued

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
			Without Substituents						
					Percent	Percent	Percent	Percent	Percent
63	50788	Phosphonic amide, P,P-bis(1-aziridinyl)-N-octyl-		E. Kuh, Rutgers Univ.	5.0	NO	0	--	--
					2.5	0[3/]	0	0[3/]	0
					1.0	43	34	37	24
64	50716	Phosphine oxide, bis=(1-aziridinyl)(hexa=hydro-1H-azepin-1-yl)-		Borden Chemical Co.	1.0	1	0	0	0
					1.0	42(7)♂	13(3)♂	0(0)♂	0(0)♂
					0.5	30	29	0	0
					.5	--	--	0(0)♂	0(0)♂
					.25	93	71	0	0
					.25	--	--	0(2)♂	0(0)♂
					.1	--	--	2	2
					.05	--	--	88	84
65	26400	Phosphine oxide, bis=(1-aziridinyl)morpho=lino		CCNSC	5.0	[1/]	[1/]	--	--
					2.5	NO[5/]	0	--	--
					1.0	95	0	--	--
					1.0	95	0	--	--
					.5	95	0	--	--
					.25	95	90	--	--
					.1	95	90	--	--
66	50106	Phosphinic amide, P,P-bis(1-aziridinyl)-N-(p-methoxyphenyl)-		American Cyanamid Co.	5.0	--	--	50[2/][3/]	0
					2.5	NO	--	--	--
					1.0	95	0	0	0
					0.5	--	--	3	0
					.25	--	--	0	0
					.1	95	90	--	--
67	50450	Carbamic acid, [bis=(1-aziridinyl)phos=phinyl]-, ethyl ester		Armour Pharm. Co.	5.0	--	--	NO[1/]	0
					2.5	--	--	NO[5/]	0
					1.0	100	0	NO	0
					1.0	NO[1/]	0	90	0
					0.5	0	0	10	0
					.5	--	--	0♂	0♂
					.25	0	0	3	0
					.1	5	0	3	0
					.05	0	0	0	0
					.025	90	79	88	0
					.01	98	91	89	31

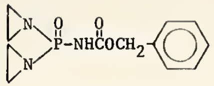
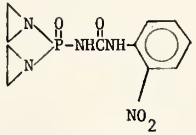
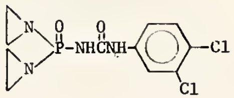
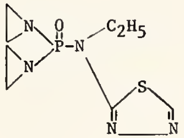
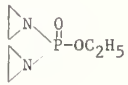
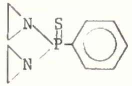
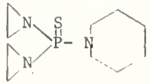
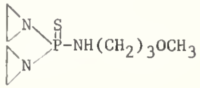
68	50451	Carbamic acid, [bis=(1-aziridinyl)=phosphinyl]-, benzyl ester		The Squibb Inst.	2.5	--	--	NO	0
					1.0	92	0	0	0
					1.0	--	--	17♂	15♂
					0.5	--	--	0	0
					.25	87	0	0(42)	0(0)
					.1	--	--	0	0
					.05	98	13	22(0)	0(0)
					.25	89	65	6	4
					.01	95	77	22	19
69	50780	Urea, 1-[bis=(1-aziridinyl)=phosphinyl]-3-(o-nitrophenyl)-		do	5.0	0	0	--	--
					2.5	0	0	69	23
					1.0	4	0	36	29
					0.5	4	0	--	--
					.25	0	0	--	--
					.1	88	56	--	--
					.05	77	43	--	--
70	50781	Urea, 1-[bis=(1-aziridinyl)=phosphinyl]-3-(3,4-dichloro=phenyl)-		do	5.0	0	0	--	--
					2.5	0	0	--	--
					2.5	3o	0o	--	--
					1.0	0	0	80	66
					0.5	0	0	--	--
					.25	21	0	--	--
					.25	--	--	0♂	0♂
					.1	0	0	--	--
					.05	0	0	--	--
					.025	50	47	--	--
					.01	60	56	--	--
71	50002	Phosphinic amide, P,P-bis(1-aziri=dinyl)-N-ethyl-N-1,3,4-thiadiazol-2-yl-		American Cyanamid Co.	5.0	1/	1/	--	--
					2.5	NO1/	0	--	--
					1.0	NO	0	100	87
					1.0	NO1/	0	--	--
					0.25	95	90	--	--
					.1	95	90	--	--
					.1	95	90	--	--
					.1	95	90	--	--

Table 2.--Diaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
Without Substituents									
					Percent	Percent	Percent	Percent	Percent
72	50761	Phosphinic acid, bis=(1-aziridinyl)-, ethyl ester		Continental Oil Co.	1.0	NO1/	0	94	87
					0.5	0	0	--	--
					.5	0♂	0♂	--	--
					.25	0(3)	0(1)	--	--
					.25	14♂	9♂	--	--
					.1	49(0)	44(0)	--	--
					.1	61♂	52♂	--	--
					.05	0	0	--	--
					.025	32	21	--	--
					.025	34(73)♂	26(58)♂	--	--
					.01	100	72	--	--
73	50318	Phosphine sulfide, bis(1-aziridinyl)=phenyl		American Agricultural Chemical Co.	5.0	--	--	9	9
					2.5	--	--	2	0
					1.0	NO(15)	0(12)	0(39)	0(31)
					0.5	7	1	58	51
					.25	6	5	76	62
					.1	97	71	91	63
					.05	60	36	87	82
74	50396	Phosphine sulfide, bis(1-aziridinyl)=(hexahydro-1H-azepin-1-yl)-		do	1.0	NO(35)	0(0)	0(100)	0(0)
					0.5	0	0	100	0
					.25	0	0	18	0
					.1	88	76	99	58
					.05	62	53	99	22
75	50981	Phosphinothioic amide, P,P-bis(1-aziridinyl)-N-(3-methoxypropyl)-		Stauffer Chemical Co.	1.0	1/	1/	NO5/	0
					0.5	1/	1/	04/	0
					.25	NO3/	0	5	0
					.1	1/	1/	0	0
					.1	--	--	0(0)(0)♂	0(0)(0)♂
					.05	23	16	0	0
					.05	--	--	0(0)(0)♂	0(0)(0)♂
					.025	--	--	0	0
					.025	--	--	0(0)♂	0(0)♂
					.01	--	--	28	24

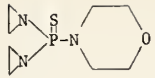
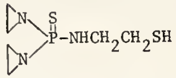
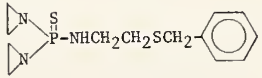
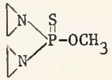
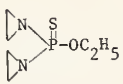
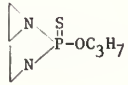
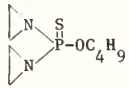
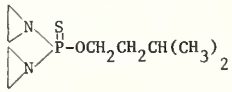
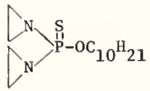
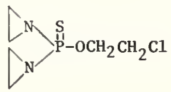
76	25301	Phosphine sulfide, bis(1-aziridinyl)= morpholino-		American Cyanamid Co.	1.0	5(NO)	0(0)	8	0
					1.0	NO4/	0	--	--
					1.0	954/	0	--	--
					1.0	0♂	0♂	--	--
					0.5	95(9)	0(0)	--	--
					.25	4(95)(95)	0(0)(90)	--	--
					.1	95(95)	90(90)	--	--
					.1	95(954/)	0(0)	--	--
					.1	4	0	--	--
					.05	1(95)	0(0)	--	--
					.05	95(95)	0(90)	--	--
					.05	95♂	90♂	--	--
					.025	95	90	0	0
					.01	95	90	55	14
					.005	95	90	--	--
77	50763	Phosphinothioic amide, P,P-bis(1-aziridinyl)- N-(2-mercaptoethyl)-		Continental Oil Co.	1.0	1/	1/	92	90
					0.5	NO1/	0	--	--
					.25	94	90	--	--
78	50762	Phosphinothioic amide, P,P-bis(1-aziridinyl)- N-[2-(benzylthio)= ethyl]-		do	1.0	1/	1/	82	80
					0.5	1/	1/	--	--
					.25	1/	1/	--	--
					.1	92	68	--	--
					.05	87	75	--	--
79	50765	Phosphinothioic acid, bis(1-aziridinyl)-, O-methyl ester		American Agricultural Chemical Co.	1.0	1/	1/	95	0
					0.5	0	0	0(0)	0(0)
					.25	0	0	15(0)	15(0)
					.1	0	0	0	0
					.05	0	0	19	19
					.025	27	24	--	--
					.01	70	66	--	--
80	50042	Phosphinothioic acid, bis(1-aziridinyl)-, O-ethyl ester		do	5.0	NO1/	0	--	--
					2.5	NO5/	0	--	--
					1.0	NO1/	0	0	0
					0.5	3	0	0	0
					.25	6	0	0	0
					.1	95(NO)	0(0)	5(66)	5(52)
					.05	95	90	50	35
					.05	--	--	81♂	68♂
					.025	95	90	NO	0
					.01	95	90	--	--

Table 2.--Diaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house fl ,-- Continued

Item	Entomology No. (ENT-)	Name	Structure	Source	Concen- tration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
			Without Substituents						
					Percent	Percent	Percent	Percent	Percent
81	50044	Phosphinothioic acid, bis(1-aziridinyl)-, O-propyl ester		American Agricultural Chemical Co.	1.0	1/	1/	--	--
					0.1	1/,1/	1/,1/	--	--
					.1	95 1/	90 1/	--	--
					.05	--	--	85	79
					.025	--	--	98	86
					.01	--	--	99	97
82	50315	Phosphinothioic acid, bis(1-aziridinyl)-, O-butyl ester		do	5.0	--	--	0	0
					2.5	--	--	2	0
					1.0	1/	1/	2(1)	0(0)
					0.5	1/		3	1
					.25	0 5/	0	5	0
					.25	--	--	11♂	6♂
					.1	0 4/	0	12	8
					.05	0	0	78	78
					.05	0(20)♂	0(20)♂	--	--
					.025	26	26	--	--
					.01	87	77	--	--
83	50391	Phosphinothioic acid, bis(1-aziridinyl)-, O-isopentyl ester		Continental Oil Co.	5.0	1/		0 5/	0 5/
					2.5	--	--	48	9
					1.0	NO(2 5/)	0(0)	1	1
					0.5	4 4/(5)	0(3)	99(85)	4(25)
					.5	19♂	6♂		
					.25	16	16	72	62
					.25	79	8	--	--
					.1	80	67	82	72
					.05	98	86	--	--
84	50317	Phosphinothioic acid, bis(1-aziridinyl)-, O-decyl ester		American Agricultural Chemical Co.	2.5	0	0	0(5)	0(0)
					1.0	36(5)	0(0)	0(8)	0(4)
					0.5	37	18	12	12
					.25	88	70	20	20
					.1	82	61	98	78
					.05	97	94	92	75
85	50311	Phosphinothioic acid, bis(1-aziridinyl)-, O-2-chloroethyl ester		do	5.0	NO 1/	0	2 4/	0
					2.5	NO 1/	0	0	0
					1.0	0(20)	0(18)	0(0)	0(0)
					0.5	1/	1/	0	0
					.25	NO 1/	0	0	0
					.1	0	0	0	0
					.05	2	2	1	1
					.025	15	12	89	46

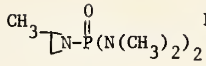
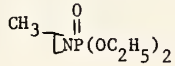
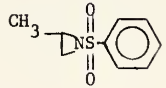
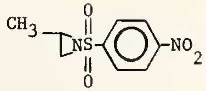
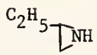
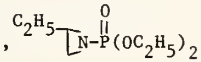
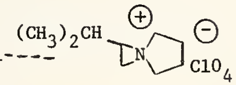
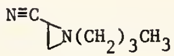
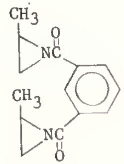
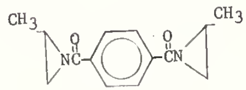
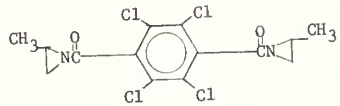
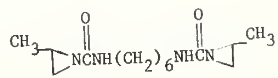
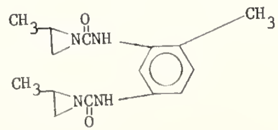
86	60181	Phosphonic diamide, N,N,=N',N'-tetramethyl-P-(2-methyl-1-aziridinyl)-		PCRB	1.0	4[3/]	0	9[6/]	0
					1.0	4(54)♂	4(52)♂	NO(0)♂	0(0)♂
					1.0	10♂	0♂	4♂	0♂
					.5	8	7	63	54
					.25	52	39	87	74
87	50408	Phosphonic acid, (2-methyl-1-aziridinyl)-, diethyl ester		Interchemical Corp.	1.0	-	-	96	92
88	50402	Aziridine, 2-methyl-1-(phenylsulfonyl)-		do.	1.0	-	-	99	91
89	50707	Aziridine, 2-methyl-1-[(p-nitrophenyl)sul=fonyl]-		do.	1.0	100	100	100	91
90	50860	1-Aziridineethanol, 2-vinyl-		CCNSC	1.0	93	87	56	48
91	50403	Aziridine, 2-ethyl-		Interchemical Corp.	1.0	-	-	98	89
92	50710	Phosphonic acid, (2-ethyl-1-aziridinyl)-, diethyl ester		do.	1.0	98	85	98	92
93	50943	3-Azoniaspiro[2,4]=heptane, 1-isopropyl----perchlorate		J. Paukstelis, Univ. Ill.	1.0	85	71	70	63
94	50880	2-Aziridinecarbonitrile, 1-butyl-		Interchemical Corp.	1.0	92	75	100	91

Table 2.--Diaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
			With Substituents		Percent	Percent	Percent	Percent	Percent
95	50530	Aziridine, 1,1'-iso=phthaloylbis[2-methyl-		PCRB	1.0	80	56	90	60
96	50404	Aziridine, 1,1'-terephthaloylbis=[2-methyl-		Interchemical Corp.	1.0	100	86	87(100)	84(86)
97	50399	Aziridine, 1,1'-(tetrachlorotere=phthaloyl)bis[2-methyl-		do	1.0	--	--	94	90
98	50885	1-Aziridinecar=boxamide, N,N'-hexamethylene=bis[2-methyl-		The Squibb Inst.	1.0	2	0	0(0)	0(0)
					1.0	76♂	67♂	0(0)(0)♂	0(0)(0)♂
					0.5	3	0	9(0)	9(0)
					.5	--	--	0(NO)(0)♂	0(-)(0)♂
					.25	51	44	0(0)	0(0)
					.25	15(16)(NO)♂			
					.25	--	15(0)(0)♂	0(0(0)♂	0(0)(0)♂
					.1	--	--	86(4)(0)	80(0)(0)
					.1	--	--	0(0)(0)♂	0(0)(0)♂
					.05	--	--	100(0)(0)	98(0)(0)
					.025	--	--	8(4)	0(4)
					.025	--	--	0(0)(32)♂	0(0)(25)♂
					.025	--	--	4(8)(43)♂	4(7)(20)♂
					.01	--	--	56(33)	45(26)
					.01	--	--	0(0)(0)♂	0(0)(0)♂
99	50887	1-Aziridinecar=boxamide, N,N'-(4-methyl-m-phenylene)bis=[2-methyl-		do	1.0	0	0	0	0
					1.0	6(0)(0)♂	3(0)(0)♂	--	--
					.5	3	3	0	0
					.25	21	21	0	0
					.25	45(69)♂	43(58)♂	--	--
					.1	--	--	95(0)(0)	81(0)(0)
					.05	--	--	97(0)(0)	87(0)(0)
					.025	--	--	0(0)	0(0)
					.1	--	--	0(16)	0(14)
					.005	--	--	0(44)	0(36)
					.005	--	--	0(NO)(NO)♂	0(0)(0)♂
					.0025	--	--	26(87)	0(61)
					.001	--	--	100(85)	72(72)
					.0005	--	--	89	67

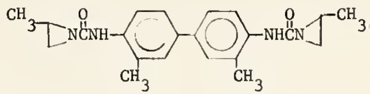
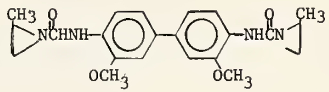
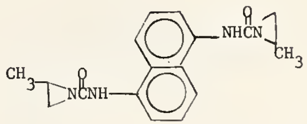
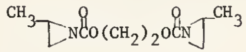
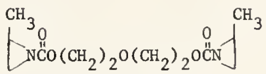
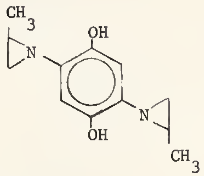
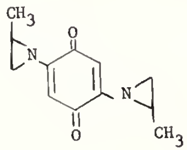
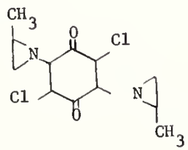
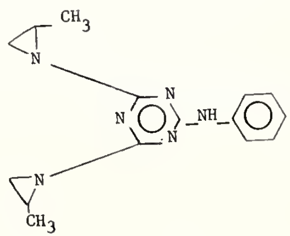
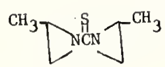
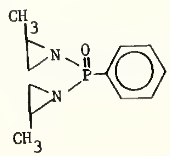
100	50663	4',4'''-Bi[1-aziridinecar=boxy-o-tolui=dide], 2;2"-dimethyl-		PCRB	1.0	100	76	97	80
101	50667	4',4"'-Bi[1-aziridinecar=box-o-anisi=dide], 2,2"-dimethyl-		PCRB	1.0	99	79	77	61
102	50666	1-Aziridine=carboxamide N,N'-1,5-naph=thylenebis[2-methyl-		PCRB	5.0 2.5 1.0 0.5 .25 .1 .05 .025	0 1 0 2(0) 0(13) 22(52) 5(86) 80	0 1 0 0(0) 0(6) 22(31) 0(60) 63	-- -- 0 0(1) 2(2) 0(5) 3(19) 99	-- -- 0 0(1) 1(1) 0(1) 0(7) 81
103	50122	1-Aziridine=carboxylic acid, 2-methyl-, ethylene ester		Interchemical Corp.	1.0 0.1	95 95	90 90	-- --	-- --
104	50124	1-Aziridine=carboxylic acid, 2-methyl-, oxydiethylene ester		do	5.0 2.5 1.0 0.5 .25 .1	2 5/ 22 NO -- -- 95	0 0 0 -- -- 90	-- -- 94 98 100 --	-- -- 86 93 74 --
105	50056	Hydroquinone, 2,5-bis(2-methyl-1-aziridinyl)-		PCRB	1.0 0.1	95 95	90 90	-- --	-- --

Table 2.--Diaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
			With Substituents						
					Percent	Percent	Percent	Percent	Percent
106	50424	p-Benzoquinone, 2,5-bis(2-methyl-1-aziridinyl)=		Interchemical Corp.	5.0	0	0	--	--
					2.5	0	0	4	0
					1.0	0(0)	0(0)	32(8)	13(0)
					1.0	11♂	11♂	0♂	0♂
					0.5	2	2	82	0
					.25	96	78	--	--
					.1	98	83	92	82
					.05	95	79	98	84
107	50730	p-Benzoquinone, 2,5-dichloro-3,6-bis=(2-methyl-1-aziridinyl)-		do.	1.0	93	91	77	70
108	50708	s-Triazine, 2-anilino-4,6-bis(2-methyl-1-aziri=dinyl)-		do.	1.0	87	72	92	79
109	50703	Aziridine, 1,1'-thiocarbonylbis=[2-methyl-		do.	1.0	100	93	100	97
110	50005	Phosphine oxide, bis(2-methyl-1-aziridinyl)=phenyl-		do.	1.0	95(95)	90(90)	100	90
					0.1	95	90	--	--

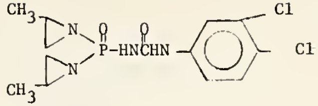
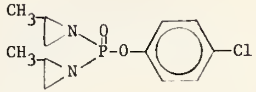
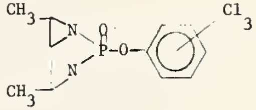
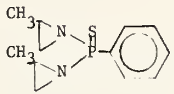
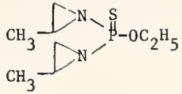
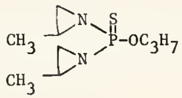
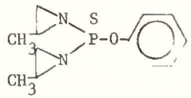
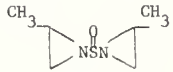
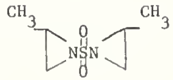
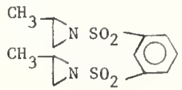
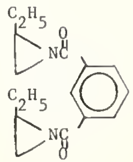
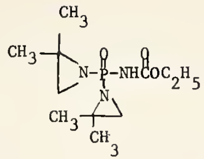
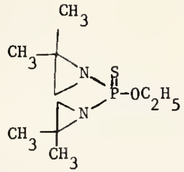
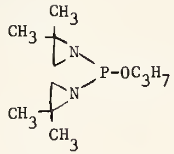
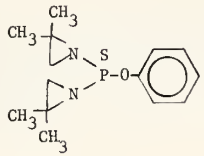
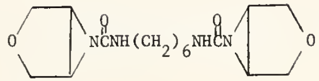
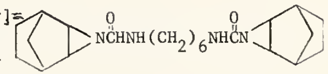
111	50886	Urea, 1-[bis(2-methyl-1-aziridinyl)=phosphinyl]-3-(3,4-dichlorophenyl)-		The Squibb Inst.	1.0	0	0	0(0)	0(0)
					1.0	0(0)(NO)♂	0(0)(0)♂	0(0)(0)♂	0(0)(0)♂
					1.0	--	--	0♂	0♂
					0.5	0	0	5(0)	5(0)
					.5	--	--	0(0)(0)♂	0(0)(0)♂
					.25	0	0	9(3)	9(3)
					.25	0(0)(NO)♂	0(0)(0)♂	0(0)(0)♂	0(0)(0)♂
					.1	24(0)	24(0)	2	2
					.1	48♂	31♂	0(0)(0)♂	0(0)(0)♂
					.05	79(0)	72(0)	9	6
					.05	89♂	86♂	--	--
					.025	59(29)	36(25)	54	38
					.01	41(61)	34(43)	--	--
112	50953	Phosphinic acid, bis=(2-methyl-1-aziri=dinyl)-, p-chloro=phenyl ester		3M Co.	1.0	19	9	0	0
					1.0	--	--	4(9)(9)♂	4(4)(9)♂
					0.5	--	--	95	79
					.25	--	--	95	76
113	50954	Phosphinic acid, bis=(2-methyl-1-aziri=dinyl)-, trichloro=phenyl ester		3M Co.	1.0	58	52	96	81
114	50426	Phosphine sulfide, bis=(2-methyl-1-aziridinyl)=phenyl-		Interchemical Corp.	1.0	NO	0	87	57
					1.0	85	72	--	--
					0.5	98	78	--	--
					.25	100	75	--	--
					.1	100	79	--	--
					.05	98	94	--	--
115	50312	Phosphinothioic acid, bis(2-methyl-1-aziridinyl)-, O-ethyl ester		American Agricultural Chemical Co.	5.0	--	--	1/	1/
					2.5	--	--	1/	1/
					1.0	1/	1/	0	0
					1.0	--	--	0(0)	0(0)
					1.0	--	--	93♂	76♂
					0.5	1/	1/	0	0
					.5	--	--	3	0
					.5	--	--	67♂	48♂
					.25	90	44	68(20)	48(12)
					.1	90	86	91(85)	77(74)
					.05	--	--	92(97)	86(72)
116	50313	Phosphinothioic acid, bis(2-methyl-1-aziridinyl)-, O-propyl ester		do.	2.5	--	--	70	42
					1.0	1/	1/	46	37
					0.5	--	--	90	79
					.25	--	--	91	71

Table 2.--Diaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
			With Substituents						
					Percent	Percent	Percent	Percent	Percent
117	50393	Phosphinothioic acid, bis(2-methyl-1-aziridinyl)-, O-phenyl ester		American Agricultural Chemical Co.	1.0	--	--	100	82
118	50361	Aziridine, 1,1'-dithiobis[2-methyl-		PCRB	5.0	NO	0	--	--
					2.5	0	0	--	--
					1.0	60	0	65	44
					1.0	93	79	--	--
					0.5	77	50	--	--
					.25	100	94	--	--
					.1	95	87	--	--
					.05	95	84	--	--
119	50358	Aziridine, 1,1'-sulfinylbis=[2-methyl-		Interchemical Corp.	5.0	--	--	NO	0
					2.5	--	--	NO	0
					2.5	--	--	84♂	76♂
					1.0	83(100)	71(86)	66(12)	58(12)
					1.0	--	--	95	84
					0.5	--	--	100	57
120	50359	Aziridine, 1,1'-sulfonylbis=[2-methyl-		PCRB	5.0	14	12	--	--
					2.5	5	5	--	--
					1.0	0(39)	0(37)	1/	1/
					0.5	78	65	25	19
					.25	97	86	88	79
					.1	100	86	99	77
					.05	96	71	82	63
121	50128	Aziridine, 1,1'-(m-phenylene=disulfonyl)bis=[2-methyl-		Interchemical Corp.	1.0	95	90	--	--
					0.1	95	90	--	--
122	50964	Aziridine, 1,1'-isophthal=oylbis[2-ethyl-		3 M Co.	1.0	88	78	57	53

123	50452	Carbamic acid, [bis=(2,2-dimethyl-1-aziridinyl)phos=phinyl]-, ethyl ester		Armour Pharm. Co.	1.0	--	--	99	75
124	50395	Phosphinothioic acid, bis(2,2-dimethyl-1-aziridinyl)-, O-ethyl ester		Continental Oil Co.	5.0 2.5 1.0	-- -- --	-- -- --	1/ 1/ 15	1/ 1/ 13
125	50314	Phosphinothioic acid, bis(2,2-dimethyl-1-aziridinyl-, O-propyl ester		American Agri-cultural Chemical Co.	5.0 2.5 1.0	-- -- 21	-- -- 17	2 2 16(18)	0 0 12(10)
126	50394	Phosphinothioic acid, bis(2,2-dimethyl-1-aziridinyl)-, O-phenyl ester		Continental Oil Co.	1.0	--	--	99	86
127	51236	3-Oxa-6-azabicyclo=[3.1.0]hexane-6-carboxamide, N,N'-hexamethylenebis-		PCRB	1.0	99	87	92	91
128	51327	3-Azatricyclo[3.2.1.0^{2,4}]=octane-3-carboxamide, N,N'-hexamethylenebis-		PCRB	1.0	90	76	80	73

1/ Mortality 81-100 percent.

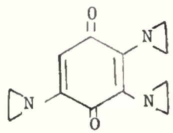
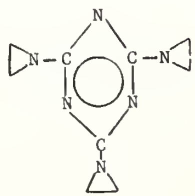
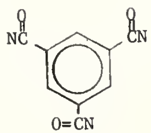
2/ Low oviposition.

3/ Mortality 41-60 percent.

4/ Mortality 20-40 percent.

4/ Mortality 61-80 percent.

Table 3.--Triaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
			Without Substituents						
					Percent	Percent	Percent	Percent	Percent
1	51086	p-Benzoquinone, tris(1-aziri= dinyl)-		CCNSC	1.0	1/	1/	1/	1/
					0.5	1/	1/	1/	1/
					.25	02/	0	1/	1/
					.1	0	0	--	--
					.1	12♂	5♂	--	--
					.05	10	8	--	--
					.05	32♂	32♂	--	--
2	25296	s-Triazine, 2,4,6-tris(1-aziridinyl)-		Commercial	5.0	--	--	1/	1/
					2.5	--	--	NO1/	0
					1.0	95	90	1/	1/
					1.0	NO(NO)3/	0(0)3/	--	--
					1.0	NO1/	01/	--	--
					0.5	NO	0	NO	0
					.5	NO2/	0	--	--
					.25	0	0	66	5
					.25	NO3/	03/	--	--
					.1	95(95)(95)	90(90)(90)	--	--
					.05	95(95)(0)	90(90)(0)	--	--
					.025	0	0	--	--
					.01	95	90	--	--
					.005	95	90	--	--
3	50736	Aziridine, 1,1',1''-(s-phenyltricar= bonyl)tris-		PCRB	5.0	0	0	70	63
					5.0	26♂	24♂	3♂	2♂
					2.5	0	0	7	7
					1.0	3	3	22	14

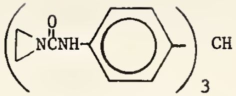
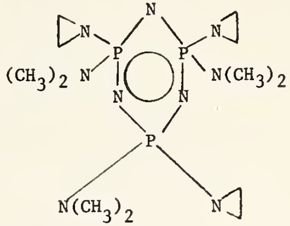
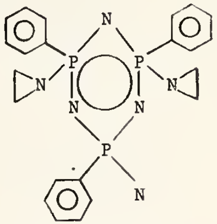
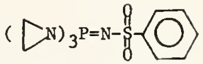
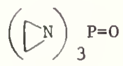
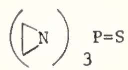
4	50176	1-Aziridinecarbox= anilide, 4', 4''',= 4'''''-methylidyne= tris-		Chemirad Corp.	1.0	100	75	88	60
5	50298	1,3,5,2,4,6-Triaza= triphosphorine, 2,4,6-tris(1-azi= ridinyl)-2,4,6- tris(dimethylamino)- 2,2,4,4,6,6-hexa= hydro-		The Squibb Inst.	2.5	--	--	65	0
					1.0	6	0	4	1
					1.0	2♂	0♂	0♂	0♂
					1.0	--	--	3	0
					0.5	27	26	3	0
					.25	76	72	0	0
					.1	91	90	3	2
					.05	87	82	18	13
6	50877	1,3,5,2,4,6-Triaza= triphosphorine, 2,4,6-tris(1-azi= ridinyl)- 2,2,4,4,= 6,6-hexahydro- 2,4,6-triphenyl-		Interchemical Corp.	5.0	87	83	--	--
					2.5	70	48	--	--
					1.0	7	7	94	84
7	50845	Benzenesulfonamide, N-[tris(1-aziridinyl)= phosphoranylidene]-		Sankyo Co.	1.0	20	0	4/	4/
					0.5	0	0	0	0
					.5	2(2)♂	2(0)♂	0(0)♂	0(0)♂
					.25	0	0	0	0
					.25	1(8)♂	1(8)♂	0(0)♂	0(0)♂
					.1	44	37	0	0
					.1	--	--	0(0)(0)♂	0(0)(0)♂
					.05	42(81)	37(72)	0	0
					.05	--	--	0(0)(10)♂	0(0)(10)♂
					.025	--	--	75	50
					.01	--	--	72	46

Table 3.--Triaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies--Continued

Item	Entomology No. (ENT-)	Name	Structure	Source	Concen-tration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
				Without Substituents					
					Percent	Percent	Percent	Percent	Percent
8	24915	Phosphine oxide, tris=(1-aziridinyl)-		Interchemical Corp.	1.0	NO3/	03/	0	0
					1.0	--	--	1/	1/
					1.0	0♂	0♂	0♂	0♂
					0.5	NO(0)	0(0)	13	0
					.5	0♂	0♂	0♂	0♂
					.3	0(0)	0(0)	--	--
					.25	0(0)	0(0)	22	0
					.25	0(0)	0(0)	--	--
					.25	0♂	0♂	0♂	0♂
					.2	95(95)(95)	90(90)(90)	--	--
					.2	95(95)(95)	90(90)(90)	--	--
					.1	95(0)	90(0)	0	0
					.1	0(95)	0(90)	--	--
					.1	0♂	0♂	0♂	0♂
					.05	95(95)	90(90)	0	0
					.05	0	0	--	--
					.05	0♂	0♂	0♂	0♂
					.025	95(0)	90(0)	--	--
					.025	12♂	8♂	0♂	0♂
					.01	0	0	--	--
					.01	56♂	37♂	0♂	0♂
					.005	95	90	--	--
					.005	79♂	66♂	0♂	0♂
					.0025	--	--	2♂	0♂
9	24916	Phosphine sulfide, tris(1-aziridinyl)-		do.	1.0	952/	902/	96	81
					1.0	1/	1/	--	--
					1.0	NO2/	02/	--	--
					1.0	95(94)	90(87)	--	--
					0.5	88	75	98	86
					.5	NO1/	01/	--	--
					.25	62	53	98	72
					.25	NO2/	02/	--	--
					.125	95	90	--	--
					.05	0	0	--	--
					.025	NO	0	--	--
					.0125	0	0	--	--
					.005	95	90		

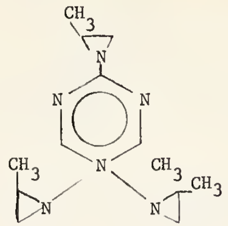
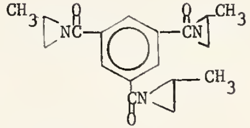
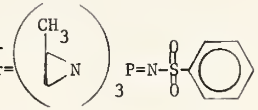
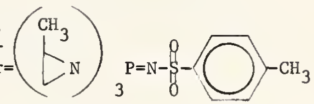
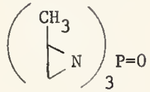
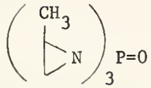
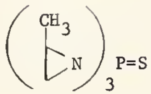
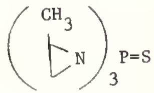
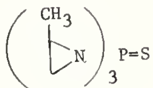
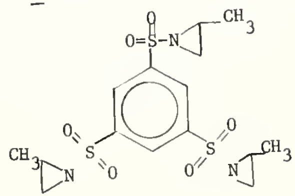
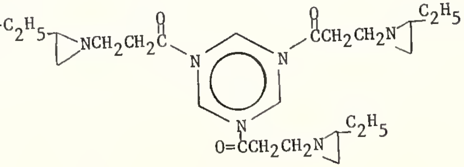
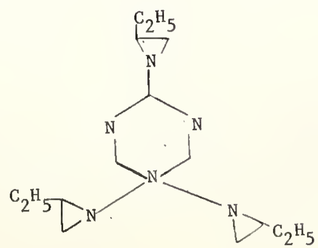
With Substituents									
10	50055	s-Triazine, 2,4,6- tris(2-methyl-1- aziridinyl)-		Interchemical Corp.	2.5 1.0 1.0 1.0 0.5 .25 .1 .05	-- 1/ 95 1/ -- -- -- 95(95) --	-- 1/ 90 1/ -- -- -- 90(90) --	NO 1/ 0 -- 0♂ 3 10 4 6	0 1/ 0 -- 0♂ 0 0 1 0
11	50419	Aziridine, 1,1',= 1''-(s-phenenyl= tricarbonyl)tris= [2-methyl-		do.	1.0	--	--	96	86
12	50425	Benzenesulfonamide, N-[tris(2-methyl-1- aziridinyl)phosphor= anylidene]-		do.	1.0	--	--	89	71
13	50704	p-Toluenesulfonamide, N-[tris(2-methyl-1- aziridinyl)phosphor= anylidene]-		do.	1.0	96	83	100	90
14	50003	Phosphine oxide, tris(2-methyl-1- aziridinyl)-		do.	1.0 1.0 0:5 .5 .4 .3 .25 .1	0 NO 3/ 0(0) 0(0)♂ 0 0 95 95	0 0 3/ 0(0) 0(0)♂ 0 0 90 90	8 -- 0(0)(0) -- -- -- 0 --	0 -- 0(0)(0) -- -- -- 0 --
15	50483	Phosphine oxide, tris(l-2-methyl- 1-aziridinyl)-	 l-form	A. Bottini, Univ. Calif.	1.0	10	0	65	0
16	50004	Phosphine sulfide, tris(2-methyl-1- aziridinyl)-		Interchemical Corp.	1.0 1.0 1.0 0.5 .25 .1 .05 .025	1/ -- -- 0 0 0(95) 95 95	1/ -- -- 0 0 0(90) 90 90	3 0 1♂ 0 0 7 47 --	0 0 1♂ 0 0 7 35 --

Table 3.--Triaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food Hatch	Fly food Pupae	Sugar Hatch	Sugar Pupae
			With Substituents						
					Percent	Percent	Percent	Percent	Percent
17	50782	Phosphine sulfide, tris(d-2-methyl-1-aziridinyl)-	 d-form	A. Bottini, Univ. Calif.	5.0 1.0 0.5 .25 .1 .05	NO1/ 01/ 0 74 -- --	01/ 01/ 0 43 -- --	-- 0 67 12 0 24	-- 0 32 0 0 24
18	50783	Phosphine sulfide, tris(l-2-methyl-1-aziridinyl)-	 l-form	do.	1.0	--	--	93	73
19	50420	Aziridine, 1,1',1''-(s-phenenyl=trisulfonyl)=tris[2-methyl-		Interchemical Corp.	1.0	84	67	92	81
20	50777	s-Triazine, 1,3,5-tris[3-(2-ethyl-1-aziridinyl)prop=ionyl]hexahydro-		do.	1.0	84	67	92	81
21	50963	s-Triazine, 2,4,6-tris(2-ethyl-1-aziridinyl)-		3 M Co.	1.0 0.5 .5 .25 .25 .1 .05	03/ 0 2(5)(NO)♂ 0 15(33)(17)♂ 63 95	03/ 0 2(5)(0)♂ 0 12(24)(17)♂ 54 81	1/ 27 1/ -- 46 -- -- --	1/ 26 1/ -- 29 -- -- --

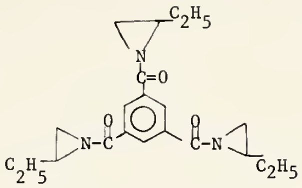
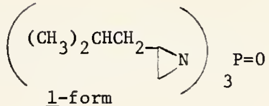
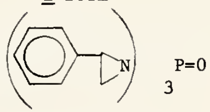
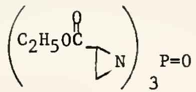
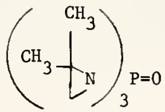
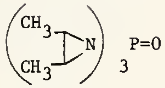
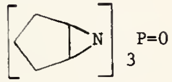
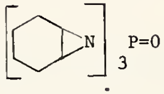
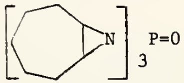
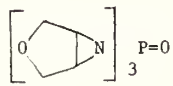
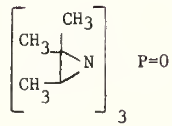
22	50955	Aziridine, 1,1',= 1''-(s-phenenyl= tricarbonyl)tris= [2-ethyl-		3 M Co.	1.0 0.5 .25	1/ 83 95	1/ 61 54	63[3/] -- --	57[3/] -- --
23	50485	Phosphine oxide, tris(l-2-isobutyl- 1-aziridinyl)-	 l-form	A. Bottini, Univ. Calif.	1.0	97	81	100	94
24	50728	Phosphine oxide, tris(2-phenyl-1- aziridinyl)-		Interchemical Corp.	1.0	87	77	84	82
25	50756	2-Aziridinecar= boxylic acid, 1,1',1''-phos= phinylidyne= tris-, triethyl .ester		PCRB	1.0	76	70	94	92
26	50423	Phosphine oxide, tris(2,2-dimethyl- 1-aziridinyl)-		Interchemical Corp.	5.0 2.5 1.0	-- -- --	-- -- --	9 23 8	9 23 5
27	50417	Phosphine oxide, tris(2,3-dimethyl- 1-aziridinyl)-		do.	1.0	--	--	75	12
28	51010	Phosphine oxide, tris(6-azabicyclo= [3.1.0]hexan-6-yl)-		PCRB	1.0	72	45	87	73
29	51009	Phosphine oxide, tris(7-azabicyclo= [4.1.0]heptan-7- yl)-		PCRB	1.0	77	64	84[1/]	63[1/]
30	51011	Phosphine oxide, tris(8-azabicyclo= [5.1.0]octan-8-yl)-		PCRB	1.0	98	91	87	80

Table 3.--Triaziridinyl compounds without and with substituents on aziridinyl carbon: Identity, source, and sterilization to house flies

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
With Substituents									
					Percent	Percent	Percent	Percent	Percent
31	51255	Phosphine oxide, tris[3-oxa-6-azabicyclo=[3.1.0]hexan-6-yl)-		PCRB	1.0	86	78	96	48
32	50415	Phosphine oxide, tris(2,2,3-trimethyl-1-aziridinyl)-		Interchemical Corp.	1.0	--	--	99	87

1/ Mortality 81-100 percent.

2/ Mortality 61-80 percent.

3/ Mortality 41-60 percent.

4/ Mortality 20-40 percent.

Table 4.--Compounds with four or more aziridinyl groups: Identity, source, and sterilizing activity in house flies

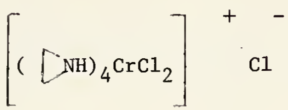
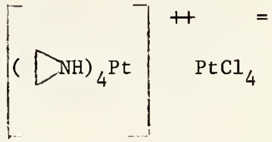
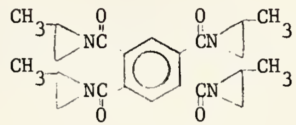
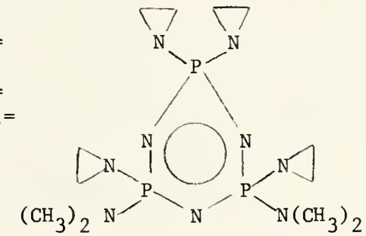
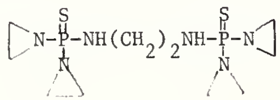
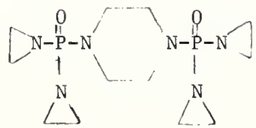
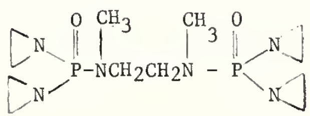
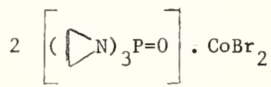
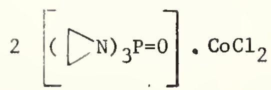
Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
					Percent	Percent	Percent	Percent	Percent
1	50873	Chromium, trans-dichlorotetrakis=(ethylenimine) chloride		PCRB	1.0	63	17	70	25
2	50875	Platinum, tetrakis=(ethylenimine)----tetrachloro=platinate(II)		PCRB	1.0	61	27	35	29
3	50427	Aziridine, 1,1',1",=1"'-(1,2,4,5-benzenetetracar=bonyl)tetrakis[2-methyl-		Interchemical Corp.	1.0	--	--	98	81
4	50441	1,3,5,2,4,6-Triaza=triphosphorine, 2,2,4,6-tetrakis=(1-aziridinyl)-4,=6-bis(dimethyl=amino)-2,2,4,4,=6,6-hexahydro-		The Squibb Inst.	1.0 0.5 .25 .1 .05	0 83 77 97 93	0 78 66 77 82	7 -- -- -- --	7 -- -- -- --

Table 4.--Compounds with four or more aziridinyl groups: Identity, source, and sterilizing activity in house flies--Continued

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food Hatch	Fly food Pupae	Sugar Hatch	Sugar Pupae
					Percent	Percent	Percent	Percent	Percent
5	50764	Phosphinothioc amide, N,N'-ethylenebis= [P,P'-bis= (1-aziridinyl)-		Continental Oil Co.	5.0	0	0	--	--
					2.5	--	--	24	11
					1.0	6	0	96	27
					0.5	0[1]/	0[1]/	--	--
					.5	0	0	--	--
					.25	17(0)	17(0)	--	--
					.1	0	0	--	--
					.05	0	0	--	--
					.025	70	63	--	--
					.01	80	74	--	--
6	50107	Phosphine oxide, 1,4-piperazine= diylbis[bis(1- aziridinyl)-		American Cyanamid Co.	5.0	NO[2]/	0[2]/	NO[3]/	0[5]/
					2.5	NO[4]/	0[4]/	NO[1]/	0[1]/
					1.0	96(0)	0(0)	0(66)	0(0)
					0.5	0	0	NO(0)	0(0)
					.25	0	0	0(0)	0(0)
					.1	0(4)	0(4)	12	0
					.05	--	--	0	0
					.025	--	--	95	79
					.01	--	--	98	87
7	26315	Phosphinic amide, N,N'-ethylenebis= [P,P-bis(1-aziri= dinyl)-N-methyl-		USDA	5.0	NO[1]/	0[1]/	--	--
					2.5	NO	0	--	--
					1.0	0	0	0	0
					1.0	0[1]/	0[1]/	--	--
					0.5	0	1	0	0
					.25	NO	0	0	0
					.1	95	90	93	10
8	51133	Cobalt dibromobis= [tris(1-aziridinyl)= phosphine oxide]-		PCRB	1.0	94	83	97	79
9	51134	Cobalt dichlorobis= [tris(1-aziridinyl)= phosphine oxide]-		PCRB	2.5	--	--	100♂	98♂
					1.0	0	0	56	48
					1.0	0(0)(0)♂	0(0)(0)♂	--	--
					0.5	10	0	--	--
					.25	2	2	--	--
					.1	63	53	--	--
					.05	71	69	--	--

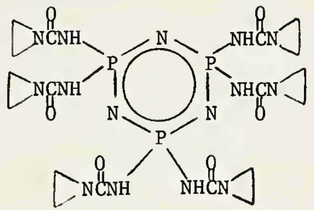
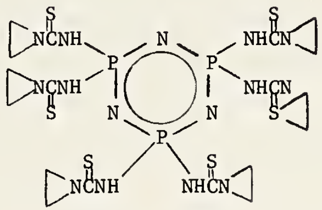
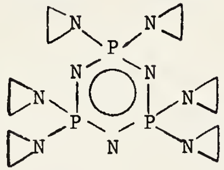
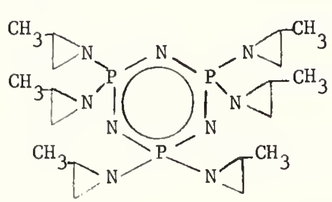
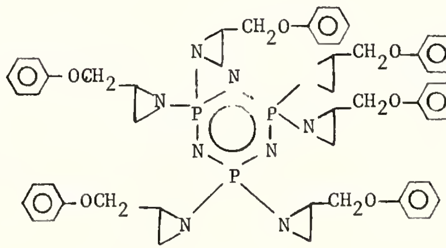
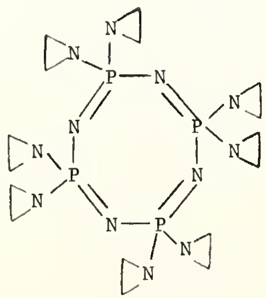
10	50299	1,3,4,2,4,6-Tri= azatriphosphorine, 2,2,4,4,6,6-hexa= kis(1-aziridinyl= carboxamido)-2,2,= 4,4,6,6-hexahydro-		The Squibb Inst.	1.0	--	--	98	93
11	50297	1,3,5,2,4,6-Triaza= triphosphorine, 2,= 2,4,4,6,6-hexakis= (1-aziridinylthio= carboxamido)-2,2= 4,4,6,6-hexahydro-		The Squibb Inst.	1.0	--	--	85	79
12	26316	1,3,5,2,4,6-Triaza= triphosphorine, 2,2,4,4,6,6-hexakis= (1-aziridinyl)-2,2= 4,4,6,6-hexahydro-		The Squibb Inst.	5.0	NO	0	--	--
					2.5	12	0	--	--
					1.0	0(0)	0(0)	0	0
					1.0	0(0)	0(0)	--	--
					1.0	0	0	--	--
					1.0	0(0)(0)♂	0(0)(0)♂	--	--
					1.0	0(0)♂	0(0)o	--	--
					0.75	0	0	--	--
					.5	0(0)(0)	0(0)(0)	0	0
					.5	--	--	0(0)(0)♂	0(0)(0)♂
					.25	95	90	0	0
					.25	0(0)	0(0)	--	--
					.25	--	--	0(0)(0)♂	0(0)(0)♂
					.1	95(0)	90(0)	0	0
					.1	71(95)	0(90)	--	--
					.1	0	0	--	--
					.1	--	--	0(0)(NO)♂	0(0)(0)♂
					.05	95(91)	90(33)	0	0
					.05	--	--	0(0)(0)♂	0(0)(0)♂
					.025	--	--	0	0
					.025	--	--	0(0)(0)♂	0(0)(0)♂
					.01	95(97)	90(81)	4	4
					.01	--	--	22o	14o
					.005	--	--	23	23
					.002	99	53	--	--

Table 4.--Compounds with four or more aziridinyl groups: Identity, source, and sterilizing activity in house flies--Continued

Item	Entomology No. (ENT-)	Name	Structure	Source	Concentration	Sterilization at indicated insect stage with compound in-- Fly food: Hatch	Fly food: Pupae	Sugar: Hatch	Sugar: Pupae
					Percent	Percent	Percent	Percent	Percent
13	50123	1,3,5,2,4,6-Triaza= triphosphorine, 2,2,4,4,6,6-hexa= hydro-2,2,4,4,6,6-hexakis(2-methyl-1-aziridinyl)-		Interchemical Corp.	5.0	NO[4/]	0[4/]	--	--
					2.5	NO[4/]	0[4/]	--	--
					1.0	0[3/]	0[3/]	78	50
					1.0	0(60)	0(14)	76(97)	32(71)
					1.0	--	--	78(89)	55(49)
					0.5	0	0	--	--
					.25	97	96	--	--
					.1	95	90	--	--
14	50300	1,3,5,2,4,6-Triaza= triphosphorine, 2,2,4,4,6,6-hexa= hydro-2,2,4,4,6,6-hexakis[2-(phenoxy= methyl)-1-aziri= dinyl]-		The Squibb Inst.	1.0	--	--	99	99
15	50057	1,3,5,7,2,4,6,8-Tetraazatephos= phocine, 2,2,4,4,= 6,6,8,8-octakis= (1-aziridinyl)-2,= 2,4,4,6,6,8,8-octahydro-		Olin Mathieson	5.0	--	--	9	9
					2.5	--	--	20	20
					1.0	5	4	--	--
					0.5	0(95)	0(90)	--	--
					.25	10(95)	6(90)	--	--
					.1	95(23)	90(9)	--	--
					.05	--	--	100	74

1/ Mortality 20-40 percent.

2/ Mortality 61-80 percent.

3/ Mortality 81-100 percent.

4/ Mortality 41-60 percent.